

SMILE CCN[C@@H]1C[C@H](N)[C@@H]([C@@H]([C@H]1O)[C@H]1OC[C@]([C@@H]([C@H]1O)NC(C)O)O)[C@H]1O[C@H](CN)CC[C@H]1N
S

Physicochemical Properties

Formula	C21H43N5O7
Molecular weight	477.60 g/mol
Num. heavy atoms	33
Num. arom. heavy atoms	0
Fraction Csp3	1.00
Num. rotatable bonds	8
Num. H-bond acceptors	12
Num. H-bond donors	8
Molar Refractivity	118.31
TPSA	

Topological Polar Surface Area:
Calculated from Ertl P. et al. 2000 J. Med. Chem. 199.73 Å²

Lipophilicity
Log $P_{o/w}$ (iLOGP) 2.17

iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.

Log $P_{o/w}$ (XLOGP3) -4.16
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.

Log $P_{o/w}$ (WLOGP) -3.33
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.

Log $P_{o/w}$ (MLOGP) -2.92
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull.

SwissADME

Delaney JS. 2004 J. Chem. Inf. Model.

Solubility 1.06e+03 mg/ml ; 2.23e+00 mol/l
Class ?

Solubility class: Log S scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log S (Ali) 0.57
Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.

Solubility 1.78e+03 mg/ml ; 3.73e+00 mol/l
Class ?

Solubility class: Log S scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log S (SILICOS-IT) 0.14
SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com

Solubility 6.62e+02 mg/ml ; 1.39e+00 mol/l
Class ?

Solubility class: Log S scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Pharmacokinetics

GI absorption Low
Gastrointestinal absorption: according to the white of the BOILED-Egg

BBB permeant No
BBB permeation: according to the yolk of the BOILED-Egg

P-gp substrate Yes

P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77

Lipinski PA. et al. 2001
[Adv. Drug. Deliv. Rev.](#)

Log $P_{o/w}$ (SILICOS-IT)

②

SILICOS-IT: Hybrid
 fragmental/topological
 method calculated by
 FILTER-IT program, -3.40
 version 1.0.2, courtesy
 of SILICOS-IT,
[http://www.silicos-
 it.com](http://www.silicos-it.com)

Consensus Log $P_{o/w}$

②

Consensus Log $P_{o/w}$: -2.33
 Average of all five
 predictions

External: ACC=0.88 /

AUC=0.94

CYP1A2 inhibitor ②

**Cytochrome P450 1A2
 inhibitor:** SVM model
 built on 9145 molecules
 (training set), No
 and tested on 3000
 molecules (test set)
 10-fold CV: ACC=0.83 /
 AUC=0.90
 External: ACC=0.84 /
 AUC=0.91

CYP2C19 inhibitor ②

**Cytochrome P450
 2C19 inhibitor:** SVM
 model built on 9272
 molecules (training set), No
 and tested on 3000
 molecules (test set)
 10-fold CV: ACC=0.80 /
 AUC=0.86
 External: ACC=0.80 /
 AUC=0.87

CYP2C9 inhibitor ②

**Cytochrome P450 2C9
 inhibitor:** SVM model
 built on 5940 molecules
 (training set), No
 and tested on 2075
 molecules (test set)
 10-fold CV: ACC=0.78 /
 AUC=0.85
 External: ACC=0.71 /
 AUC=0.81

CYP2D6 inhibitor ②

**Cytochrome P450 2D6
 inhibitor:** SVM model
 built on 3664 molecules
 (training set), No
 and tested on 1068
 molecules (test set)
 10-fold CV: ACC=0.79 /
 AUC=0.85
 External: ACC=0.81 /
 AUC=0.87

CYP3A4 inhibitor ②

**Cytochrome P450 3A4
 inhibitor:** SVM model
 built on 7518 molecules
 (training set), No
 and tested on 2579
 molecules (test set)
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin
 permeation) ②

Skin permeation: -12.17 cm/s
 QSPR model
 implemented from
 Potts RO and Guy RH.
[1992 Pharm. Res.](#)

Druglikeness

Log $P_{o/w}$ (iLOGP) ?

iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model. 3.13

Log $P_{o/w}$ (XLOGP3) ?

XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry. -4.16

Log $P_{o/w}$ (WLOGP) ?

WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model. -3.33

Log $P_{o/w}$ (MLOGP) ?

MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA, et al. 2001 Adv. Drug. Deliv. Rev. -2.92

Log $P_{o/w}$ (SILICOS-IT) ?

SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com> -3.40

Consensus Log $P_{o/w}$?

Consensus Log $P_{o/w}$: Average of all five predictions -2.13

Log S (SILICOS-IT) ?

SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com> 0.14

Solubility Class ? 6.62e+02 mg/ml ; 1.39e+00 mol/l

Solubility class: Log S scale
 Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Pharmacokinetics

GI absorption ?

Gastrointestinal absorption: according to the white of the BOILED-Egg Low

BBB permeant ?

BBB permeation: according to the yolk of the BOILED-Egg No

P-gp substrate ?

P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set) 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94 Yes

CYP1A2 inhibitor ?

Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set) 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91 No

CYP2C19 inhibitor ?

Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set) 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87 No

CYP2C9 inhibitor**Cytochrome P450 2C9**

inhibitor: SVM model
[built on 5940 molecules \(training set\)](#) No
[and tested on 2075 molecules \(test set\)](#)
10-fold CV: ACC=0.78 /
AUC=0.85
External: ACC=0.71 /
AUC=0.81

CYP2D6 inhibitor**Cytochrome P450 2D6**

inhibitor: SVM model
[built on 3664 molecules \(training set\)](#) No
[and tested on 1068 molecules \(test set\)](#)
10-fold CV: ACC=0.79 /
AUC=0.85
External: ACC=0.81 /
AUC=0.87

CYP3A4 inhibitor**Cytochrome P450 3A4**

inhibitor: SVM model
[built on 7518 molecules \(training set\)](#) No
[and tested on 2579 molecules \(test set\)](#)
10-fold CV: ACC=0.77 /
AUC=0.85
External: ACC=0.78 /
AUC=0.86

Log K_p (skin permeation)

Skin permeation: -12.17 cm/s
[QSPR model implemented from Potts RO and Guy RH. 1992 Pharm. Res.](#)

Druglikeness

Lipinski**Lipinski (Pfizer) filter:**

[implemented from Lipinski CA. et al. 2001 Adv. Drug Deliv. Rev.](#) No; 2 violations: NorO>10,
[MW < 500](#) NHorOH>5
[MLOGP < 4.15](#)
[N or O < 10](#)
[NH or OH < 5](#)

Ghose**Ghose filter:**

[implemented from Ghose AK. et al. 1999 J. Comb. Chem.](#) No; 2 violations: WLOGP<-0.4,
[160 < MW < 480](#) #atoms>70
[-0.4 < WLOGP < 5.6](#)
[40 < MR < 130](#)
[20 < atoms < 70](#)

Veber

No; 1 violation: TPSA>140

Veber (GSK) filter:

[implemented from Veber DF. et al. 2002 J. Med. Chem.](#)

[Rotatable bonds < 10](#)
[TPSA < 140](#)

Egan 

[Egan \(Pharmacia\)](#)

filter: implemented


[from](#)

[Egan WJ. et al. 2000 J. Med. Chem.](#)

[WLOGP < 5.88](#)

[TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge 

[Muegge \(Bayer\) filter:](#)

implemented from

[Muegge I. et al. 2001 J. Med. Chem.](#)

[200 < MW < 600](#)

[-2 < XLOGP < 5](#)

[TPSA < 150](#)

[Num. rings < 7](#)

[Num. carbon > 4](#)

[Num. heteroatoms > 1](#)


[Num. rotatable bonds <](#)

[15](#)

[H-bond acc. < 10](#)

[H-bond don. < 5](#)

No; 4 violations: XLOGP3<-2, TPSA>150, H-acc>10, H-don>5

Bioavailability Score 

[Abbott Bioavailability](#)

Score: Probability of F

> 10% in rat

implemented from

[Martin YC. 2005 J. Med. Chem.](#)

[Med. Chem.](#)

0.17

Medicinal Chemistry

PAINS 

[Pan Assay Interference](#)

Structures:

implemented from

[Baell JB. & Holloway GA. 2010 J. Med. Chem.](#)

[Chem.](#)

0 alert

Brenk 

[Structural Alert:](#)

implemented from

[Brenk R. et al. 2008 ChemMedChem](#)

[ChemMedChem](#)

0 alert

Leadlikeness 

[Leadlikeness:](#)

implemented from

[Teague SJ. 1999 Angew. Chem. Int. Ed.](#)


[250 < MW < 350](#)

[XLOGP < 3.5](#)

[Num. rotatable bonds <](#)

[7](#)

No; 2 violations: MW>350, Rotors>7

Synthetic accessibility  6.39

[Synthetic accessibility](#)

score: from 1 (very

easy) to 10 (very

difficult)

based on 1024

fragmental contributions

(FP2) modulated by size

and complexity penalties.

Log $P_{o/w}$ (MLOGP) ?

MLOGP: Topological method implemented from
[Moriguchi I. et al. 1992 Chem. Pharm. Bull.](#)
[Moriguchi I. et al. 1994 Chem. Pharm. Bull.](#)
[Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.](#)

-4.32

Log $P_{o/w}$ (SILICOS-IT)

SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT.
<http://www.silicos-it.com>

-3.93

Consensus Log $P_{o/w}$?

Consensus Log $P_{o/w}$: Average of all five predictions

-3.24

BBB permeant ?

BBB permeation: No
[according to the yolk of the BOILED-Egg](#)

P-gp substrate ?

P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). No
10-fold CV: ACC=0.72 / AUC=0.77
External: ACC=0.88 / AUC=0.94

CYP1A2 inhibitor ?

Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). No
10-fold CV: ACC=0.83 / AUC=0.90
External: ACC=0.84 / AUC=0.91

CYP2C19 inhibitor ?

Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). No
10-fold CV: ACC=0.80 / AUC=0.86
External: ACC=0.80 / AUC=0.87

CYP2C9 inhibitor ?

Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set). No
10-fold CV: ACC=0.78 / AUC=0.85
External: ACC=0.71 / AUC=0.81

CYP2D6 inhibitor ?

Cytochrome P450 2D6 inhibitor: SVM model built on 3664 molecules (training set) and tested on 1068 molecules (test set). No
10-fold CV: ACC=0.79 / AUC=0.85
External: ACC=0.81 / AUC=0.87

CYP3A4 inhibitor ? No

Cytochrome P450 3A4 inhibitor: SVM model built on 7518 molecules (training set).

and tested on 2579
molecules (test set)
10-fold CV: ACC=0.77 /
AUC=0.85
External: ACC=0.78 /
AUC=0.86

Log K_p (skin
permeation) [?](#)

Skin permeation:

[QSPR model](#) -12.31 cm/s
implemented from
[Potts RO and Guy RH.](#)
[1992 Pharm. Res.](#)

Druglikeness

Lipinski [?](#)

Lipinski (Pfizer) filter:

implemented from
[Lipinski CA. et al. 2001](#)
[Adv. Drug Deliv. Rev.](#) No; 2 violations: NorO>10,
[MW < 500](#) NHorOH>5
[MLOGP < 4.15](#)
[N or O < 10](#)
[NH or OH < 5](#)

Ghose [?](#)

Ghose filter:

implemented from
[Ghose AK. et al. 1999 J.](#)
[Comb. Chem.](#) No; 2 violations: MW>480,
[160 < MW < 480](#) WLOGP<-0.4
[-0.4 < WLOGP < 5.6](#)
[40 < MR < 130](#)
[20 < atoms < 70](#)

Veber [?](#)

Veber (GSK) filter:

implemented from
[Veber DF. et al. 2002 J.](#)
[Med. Chem.](#) No; 2 violations: Rotors>10,
[Rotatable bonds < 10](#) TPSA>140
[TPSA < 140](#)

Egan [?](#)

**Egan (Pharmacia)
filter:** implemented

from
[Egan WJ. et al. 2000 J.](#)
[Med. Chem.](#) No; 1 violation: TPSA>131.6
[WLOGP < 5.88](#)
[TPSA < 131.6](#)

Muegge [?](#)

Muegge (Bayer) filter:

implemented from
[Muegge I. et al. 2001 J.](#)
[Med. Chem.](#)
[200 < MW < 600](#)
[-2 < XLOGP < 5](#) No; 4 violations: XLOGP3<-2,
[TPSA < 150](#) TPSA>150, H-acc>10, H-don>5
[Num. rings < 7](#)
[Num. carbon > 4](#)
[Num. heteroatoms > 1](#)
[Num. rotatable bonds <](#)
[15](#)
[H-bond acc. < 10](#)
[H-bond don. < 5](#)

Bioavailability Score ?

Abbott Bioavailability:
Score: Probability of F
 > 10% in rat
 implemented from
 Martin YC. 2005 J.
 Med. Chem.

0.11

Medicinal Chemistry

PAINS ?

Pan Assay Interference
Structures:
 implemented from
 Baell JB. & Holloway
 GA. 2010 J. Med.
 Chem.

0 alert

Brenk ?

Structural Alert:
 implemented from
 Brenk R. et al. 2008
 ChemMedChem

0 alert

Leadlikeness ?

Leadlikeness:
 implemented from
 Teague SJ. 1999 Angew.
 Chem. Int. Ed.
 250 < MW < 350
 XLOGP < 3.5
 Num. rotatable bonds <
 7

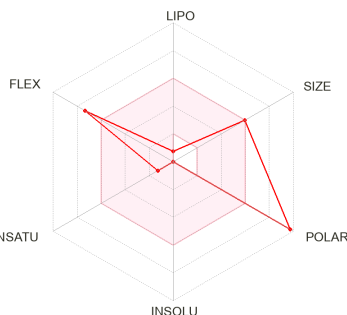
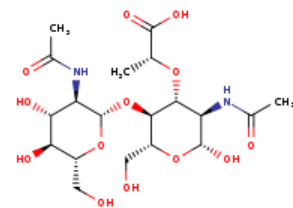
No; 2 violations: MW>350, Rotors>7

Synthetic accessibility ?

Synthetic accessibility
score: from 1 (very
 easy) to 10 (very
 difficult)
 based on 1024
 fragmental contributions
 (FP2) modulated by size
 and complexity penalties,
 trained on 12'782'590
 molecules and tested on
 40 external molecules
 ($r^2 = 0.94$)

5.81

Molecule 4



Log S (ESOL) ?

ESOL: Topological
method implemented
 from
 Delaney JS. 2004 J.
 Chem. Inf. Model.

Water Solubility

0.45

Solubility
 Class ?

1.41e+03 mg/ml ; 2.84e+00 mol/l

Solubility class: Log S
 scale
 Insoluble < -10 < Poorly
 < -6 < Moderately < -4
 < Soluble < -2 Very < 0
 < Highly

SMILE OC[C@H]1O[C@@H](O)[C@@H]([C@H]1O)[C@@H](O)C(=O)O
 S OC[C@H]1O[C@@H](O)[C@@H]([C@H]1O)[C@@H](O)C(=O)O
 S OC[C@H]1O[C@@H](O)O[C@H](C(=O)O)[C@H]1O

Physicochemical Properties

Formula C19H32N2O13



Molecular weight	496.46 g/mol	Log <i>S</i> (Ali)	
Num. heavy atoms	34	Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.	-0.10
Num. arom. heavy atoms	0		
Fraction Csp3	0.84		
Num. rotatable bonds	11		
Num. H-bond acceptors	13	Solubility	3.96e+02 mg/ml ; 7.98e-01 mol/l
Num. H-bond donors	8	Class	
Molar Refractivity	107.14	Solubility class: Log <i>S</i> scale	
TPSA		Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Very soluble
Topological Polar Surface Area:	233.57 Å²		
Calculated from Ertl P. et al. 2000 J. Med. Chem.			
	Lipophilicity	Log <i>S</i> (SILICOS-IT)	
Log <i>P</i> _{o/w} (iLOGP)		SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	2.34
iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.	-0.36		
Log <i>P</i> _{o/w} (XLOGP3)		Solubility	1.09e+05 mg/ml ; 2.19e+02 mol/l
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.	-4.20	Class	
		Solubility class: Log <i>S</i> scale	
		Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Soluble
Log <i>P</i> _{o/w} (WLOGP)			Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-4.61	GI absorption	
		Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
Log <i>P</i> _{o/w} (MLOGP)		BBB permeant	
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-4.32	BBB permeation: according to the yolk of the BOILED-Egg	No
Log <i>P</i> _{o/w} (SILICOS-IT)		P-gp substrate	
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.93	P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	No
Consensus Log <i>P</i> _{o/w}	-3.48	CYP1A2 inhibitor	No
Consensus Log <i>P</i>_{o/w}: Average of all five		Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90	

[predictions](#)[External: ACC=0.84 /](#)[AUC=0.91](#)

CYP2C19 inhibitor ⓘ

Cytochrome P450**2C19 inhibitor: SVM**[model built on 9272](#)[molecules \(training set\)](#)[and tested on 3000](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.80 /](#)[AUC=0.86](#)[External: ACC=0.80 /](#)[AUC=0.87](#)

CYP2C9 inhibitor ⓘ

Cytochrome P450 2C9**inhibitor: SVM model**[built on 5940 molecules](#)[\(training set\)](#)[and tested on 2075](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.78 /](#)[AUC=0.85](#)[External: ACC=0.71 /](#)[AUC=0.81](#)

CYP2D6 inhibitor ⓘ

Cytochrome P450 2D6**inhibitor: SVM model**[built on 3664 molecules](#)[\(training set\)](#)[and tested on 1068](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.79 /](#)[AUC=0.85](#)[External: ACC=0.81 /](#)[AUC=0.87](#)

CYP3A4 inhibitor ⓘ

Cytochrome P450 3A4**inhibitor: SVM model**[built on 7518 molecules](#)[\(training set\)](#)[and tested on 2579](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.77 /](#)[AUC=0.85](#)[External: ACC=0.78 /](#)[AUC=0.86](#)Log K_p (skin permeation) ⓘ**Skin permeation:**

QSPR model

[implemented from](#)[Potts RO and Guy RH.](#)[1992 Pharm. Res.](#)

-12.31 cm/s

Druglikeness

Lipinski ⓘ

Lipinski (Pfizer) filter:[implemented from](#)[Lipinski CA. et al. 2001](#)[Adv. Drug Deliv. Rev.](#)[MW < 500](#)[MLOGP < 4.15](#)[N or O < 10](#)[NH or OH < 5](#)No; 2 violations: NorO>10,
NHorOH>5

Ghose ?

Ghose filter:

[implemented from](#)
[Ghose AK. et al. 1999 J. Comb. Chem.](#)
[160 < MW < 480](#)
[-0.4 < WLOGP < 5.6](#)
[40 < MR < 130](#)
[20 < atoms < 70](#)

No; 2 violations: MW>480,
WLOGP<-0.4

Veber ?

Veber (GSK) filter:

[implemented from](#)
[Veber DF. et al. 2002 J. Med. Chem.](#)
[Rotatable bonds < 10](#)
[TPSA < 140](#)

No; 2 violations: Rotors>10,
TPSA>140

Egan ?

Egan (Pharmacia)**filter: [implemented](#)**

[from](#)
[Egan WJ. et al. 2000 J. Med. Chem.](#)
[WLOGP < 5.88](#)
[TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge ?

Muegge (Bayer) filter:

[implemented from](#)
[Muegge I. et al. 2001 J. Med. Chem.](#)
[200 < MW < 600](#)
[-2 < XLOGP < 5](#)
[TPSA < 150](#)
[Num. rings < 7](#)
[Num. carbon > 4](#)
[Num. heteroatoms > 1](#)
[Num. rotatable bonds < 15](#)
[H-bond acc. < 10](#)
[H-bond don. < 5](#)

No; 4 violations: XLOGP3<-2,
TPSA>150, H-acc>10, H-don>5

Bioavailability Score ?

Abbott Bioavailability

Score: [Probability of F](#)
[> 10% in rat](#)
[implemented from](#)
[Martin YC. 2005 J. Med. Chem.](#)

0.11

Medicinal Chemistry

PAINS ?

Pan Assay Interference**Structures:**

[implemented from](#)
[Baell JB. & Holloway](#)
[GA. 2010 J. Med. Chem.](#)

0 alert

Brenk ?

Structural Alert:

[implemented from](#)
[Brenk R. et al. 2008](#)
[ChemMedChem](#)

0 alert

Leadlikeness ?

No; 2 violations: MW>350, Rotors>7

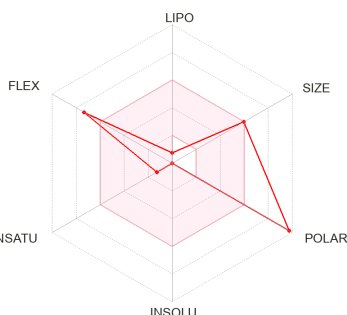
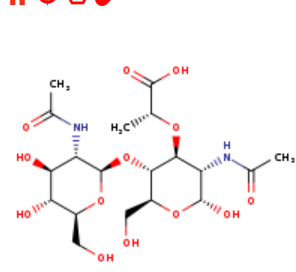
Leadlikeness:
[implemented from](#)

[Teague SJ. 1999 Angew. Chem. Int. Ed. 250 < MW < 350 XLOGP < 3.5 Num. rotatable bonds < 7](#)

Synthetic accessibility [?]

Synthetic accessibility score: from 1 (very easy) to 10 (very difficult) based on 1024 fragmental contributions 5.81 (FP2) modulated by size and complexity penalties, trained on 12'782'590 molecules and tested on 40 external molecules ($r^2 = 0.94$)

Molecule 5



Log *S* (ESOL) [?]

Water Solubility

ESOL: Topological method implemented from [Delaney JS. 2004 J. Chem. Inf. Model.](#)

0.45

Solubility Class [?]

1.41e+03 mg/ml ; 2.84e+00 mol/l

Solubility class: Log *S* scale

[Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 < Very < 0 < Highly](#)

SMILES OC[C@H]1O[C@@H](O)[C@H]([C@@H]([C@H]1O[C@@H]1O[C@@H](CO)[C@@H]([C@H]([C@@H]1NC(=O)C)O)O)O)O[C@@H](C(=O)C)O)O)O

Physicochemical Properties

Formula C19H32N2O13
 Molecular weight 496.46 g/mol
 Num. heavy atoms 34
 Num. arom. heavy atoms 0
 Fraction Csp3 0.84
 Num. rotatable bonds 11
 Num. H-bond acceptors 13
 Num. H-bond donors 8
 Molar Refractivity 107.14
 TPSA [?]

Topological Polar Surface Area:

[Calculated from Ertl P. et al. 2000 J. Med. Chem.](#) 233.57 Å²

Lipophilicity
 Log *P*_{o/w} (iLOGP) [?]

iLOGP: in-house physics-based method implemented from [Daina A et al. 2014 J. Chem. Inf. Model.](#) 1.08

Log *S* (Ali) [?]

Ali: Topological method implemented from [Ali J. et al. 2012 J. Chem. Inf. Model.](#)

-0.10

Solubility Class [?]

3.96e+02 mg/ml ; 7.98e-01 mol/l

Solubility class: Log *S* scale

[Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 < Very < 0 < Highly](#) Very soluble


Log *S* (SILICOS-IT) [?]

SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT. <http://www.silicos-it.com> 2.34

Solubility


1.09e+05 mg/ml ; 2.19e+02 mol/l

Log $P_{o/w}$ (XLOGP3) ②		Class ②	
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry	-4.20	Solubility class: Log S scale Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	
Log $P_{o/w}$ (WLOGP) ②		GI absorption ②	Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-4.61	Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
Log $P_{o/w}$ (MLOGP) ②		BBB permeant ②	
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-4.32	BBB permeation: according to the yolk of the BOILED-Egg	No
Log $P_{o/w}$ (SILICOS-IT) ②		P-gp substrate ②	
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.93	P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	No
Consensus Log $P_{o/w}$ ②		CYP1A2 inhibitor ②	
Consensus Log $P_{o/w}$: Average of all five predictions	-3.20	Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91	No
		CYP2C19 inhibitor ②	
		Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87	No
		CYP2C9 inhibitor ②	
		Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set). 10-fold CV: ACC=0.78 / AUC=0.85 External: ACC=0.71 / AUC=0.81	No

Muegge **Muegge (Bayer) filter:**

implemented from
[Muegge I. et al. 2001 J. Med. Chem.](#)
[200 < MW < 600](#)
[-2 < XLOGP < 5](#)
[TPSA < 150](#)
[Num. rings < 7](#)
[Num. carbon > 4](#)
[Num. heteroatoms > 1](#)
[Num. rotatable bonds < 15](#)
[H-bond acc. < 10](#)
[H-bond don. < 5](#)

No; 4 violations: XLOGP3<-2, TPSA>150, H-acc>10, H-don>5

Bioavailability Score **Abbott Bioavailability**

Score: Probability of F
[> 10% in rat](#) 0.11
 implemented from
[Martin YC. 2005 J. Med. Chem.](#)

Medicinal Chemistry

PAINS **Pan Assay Interference**


Structures:
 implemented from 0 alert
[Baell JB. & Holloway GA. 2010 J. Med. Chem.](#)

Brenk **Structural Alert:**

implemented from 0 alert
[Brenk R. et al. 2008 ChemMedChem](#)

Leadlikeness **Leadlikeness:**

implemented from
[Teague SJ. 1999 Angew. Chem. Int. Ed.](#) No; 2 violations: MW>350, Rotors>7
[250 < MW < 350](#)
[XLOGP < 3.5](#)
[Num. rotatable bonds < 7](#)

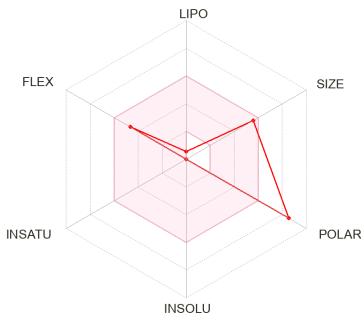
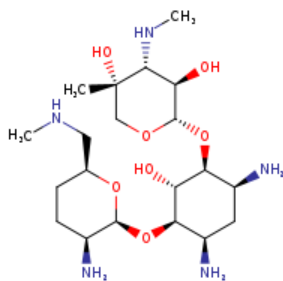
Synthetic accessibility **Synthetic accessibility**

score: from 1 (very easy) to 10 (very difficult)
 based on 1024
[fragmental contributions \(FP2\) modulated by size and complexity penalties, trained on 12'782'590 molecules and tested on 40 external molecules](#) 5.81
 ($r^2 = 0.94$)

Molecule 6



Water Solubility 



CNC[C@@H]1CC[C@@H]([C@@H]
SMILE (O1)O[C@@H]1[C@@H](N)C[C@@H]([C@@H]
S ([C@@H]1O)O[C@@H]1OC[C@@]([C@@H]
([C@@H]1O)NC)(C)O)N

Physicochemical Properties

Formula C20H41N5O7
Molecular weight 463.57 g/mol
Num. heavy atoms 32
Num. arom. heavy atoms 0
Fraction Csp3 1.00
Num. rotatable bonds 7
Num. H-bond acceptors 12
Num. H-bond donors 8
Molar Refractivity 113.50
TPSA 2

Topological Polar Surface Area:
Calculated from Ertl P. et al. 2000 J. Med. Chem.

199.73 Å²

Lipophilicity

Log P_{o/w} (iLOGP) 2
iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.

2.65

Log P_{o/w} (XLOGP3) -4.53
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.

Log P_{o/w} (WLOGP) -3.72
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.

Log P_{o/w} (MLOGP) -3.14
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994

Log S (ESOL) 0.60

ESOL: Topological method implemented from Delaney JS. 2004 J. Chem. Inf. Model.

Solubility Class 1.85e+03 mg/ml ; 4.00e+00 mol/l

Solubility class: Log S scale
Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log S (Ali) 0.96

Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.

Solubility Class 4.18e+03 mg/ml ; 9.02e+00 mol/l

Solubility class: Log S scale
Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log S (SILICOS-IT) 0.53

SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com>

Solubility Class 1.58e+03 mg/ml ; 3.40e+00 mol/l

Solubility class: Log S scale
Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Pharmacokinetics

GI absorption Low
Gastrointestinal absorption: according to the white of the BOILED-Egg

BBB permeant No
BBB permeation: according to the yolk of the BOILED-Egg

P-gp substrate Yes
P-glycoprotein substrate: SVM model built on 1033 molecules

[Chem. Pharm. Bull.](#)
[Lipinski PA, et al. 2001](#)
[Adv. Drug. Deliv. Rev.](#)

Log $P_{o/w}$ (SILICOS-IT)

?

SILICOS-IT: Hybrid
 fragmental/topological
 method calculated by
 FILTER-IT program, -3.79
 version 1.0.2, courtesy
 of SILICOS-IT,
[http://www.silicos-](http://www.silicos-it.com)
[it.com](http://www.silicos-it.com)

Consensus Log $P_{o/w}$?

Consensus Log $P_{o/w}$: -2.51
 Average of all five
 predictions

[\(training set\)](#)
 and tested on 415
 molecules [\(test set\)](#)
[10-fold CV: ACC=0.72 /](#)
[AUC=0.77](#)
[External: ACC=0.88 /](#)
[AUC=0.94](#)
 CYP1A2 inhibitor ?

Cytochrome P450 1A2
inhibitor: SVM model
 built on 9145 molecules
[\(training set\)](#)
 and tested on 3000 No
 molecules [\(test set\)](#)
[10-fold CV: ACC=0.83 /](#)
[AUC=0.90](#)
[External: ACC=0.84 /](#)
[AUC=0.91](#)

CYP2C19 inhibitor ?

Cytochrome P450
2C19 inhibitor: SVM
 model built on 9272
 molecules [\(training set\)](#)
 and tested on 3000 No
 molecules [\(test set\)](#)
[10-fold CV: ACC=0.80 /](#)
[AUC=0.86](#)
[External: ACC=0.80 /](#)
[AUC=0.87](#)

CYP2C9 inhibitor ?

Cytochrome P450 2C9
inhibitor: SVM model
 built on 5940 molecules
[\(training set\)](#)
 and tested on 2075 No
 molecules [\(test set\)](#)
[10-fold CV: ACC=0.78 /](#)
[AUC=0.85](#)
[External: ACC=0.71 /](#)
[AUC=0.81](#)

CYP2D6 inhibitor ?

Cytochrome P450 2D6
inhibitor: SVM model
 built on 3664 molecules
[\(training set\)](#)
 and tested on 1068 No
 molecules [\(test set\)](#)
[10-fold CV: ACC=0.79 /](#)
[AUC=0.85](#)
[External: ACC=0.81 /](#)
[AUC=0.87](#)

CYP3A4 inhibitor ?

Cytochrome P450 3A4
inhibitor: SVM model
 built on 7518 molecules
[\(training set\)](#)
 and tested on 2579 No
 molecules [\(test set\)](#)
[10-fold CV: ACC=0.77 /](#)
[AUC=0.85](#)
[External: ACC=0.78 /](#)
[AUC=0.86](#)

Log K_p (skin
 permeation) ? -12.34 cm/s

Skin permeation:
 QSPR model

implemented from
[Baell JB. & Holloway GA. 2010 J. Med. Chem.](#)

Brenk [?]

Structural Alert:

implemented from **0 alert**
[Brenk R. et al. 2008 ChemMedChem](#)

Leadlikeness [?]

Leadlikeness:

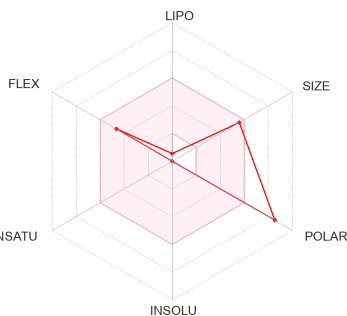
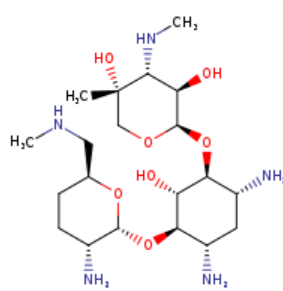
implemented from
[Teague SJ. 1999 Angew. Chem. Int. Ed.](#) **No; 1 violation: MW>350**
[250 < MW < 350](#)
[XLOGP < 3.5](#)
[Num. rotatable bonds < 7](#)

Synthetic accessibility [?]

Synthetic accessibility

score: from 1 (very easy) to 10 (very difficult) based on 1024 fragmental contributions (FP2) modulated by size and complexity penalties, trained on 12'782'590 molecules and tested on 40 external molecules ($r^2 = 0.94$) **6.33**

Molecule 7



SMILES
 CNC[C@@H]1CC[C@H]([C@H]
 (O1)O[C@@H]1[C@@H](N)C[C@H]([C@@H]
 S ([C@H]1O)O[C@H]1OC[C@]([C@@H]
 ([C@H]1O)NC)(C)O)N

Physicochemical Properties

Formula	C20H41N5O7
Molecular weight	463.57 g/mol
Num. heavy atoms	32
Num. arom. heavy atoms	0
Fraction Csp3	1.00
Num. rotatable bonds	7
Num. H-bond acceptors	12
Num. H-bond donors	8
Molar Refractivity	113.50
TPSA [?]	199.73 Å ²

Topological Polar Surface Area:

Log *S* (ESOL) [?]

ESOL: Topological method implemented from [Delaney JS. 2004 J. Chem. Inf. Model.](#)

Water Solubility

0.60

Solubility Class [?]

1.85e+03 mg/ml ; 4.00e+00 mol/l

Solubility class: Log *S* scale Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Highly

Log *S* (Ali) [?]

Ali: Topological method implemented from [Ali J. et al. 2012 J. Chem. Inf. Model.](#)

0.96

Solubility Class [?]

4.18e+03 mg/ml ; 9.02e+00 mol/l
 Highly soluble

Solubility class: Log *S* scale Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4

Calculated from Ertl P. et al. 2000 J. Med. Chem.		< Soluble < -2 Very < 0 < Highly
Log $P_{o/w}$ (iLOGP) ?	Lipophilicity	Log S (SILICOS-IT) ?
iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.	2.61	SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com
Log $P_{o/w}$ (XLOGP3) ?		Solubility Class ?
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.	-4.53	1.58e+03 mg/ml ; 3.40e+00 mol/l Solubility class: Log S scale Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly
Log $P_{o/w}$ (WLOGP) ?		Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-3.72	GI absorption ?
Log $P_{o/w}$ (MLOGP) ?		Gastrointestinal absorption: according to the white of the BOILED-Egg
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-3.14	Low
Log $P_{o/w}$ (SILICOS-IT) ?		BBB permeant ?
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.79	BBB permeation: according to the yolk of the BOILED-Egg
Consensus Log $P_{o/w}$?		P-gp substrate ?
Consensus Log $P_{o/w}$: Average of all five predictions	-2.51	P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94
		Yes
		CYP1A2 inhibitor ?
		Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91
		No
		CYP2C19 inhibitor ?
		Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87
		No

CYP2C9 inhibitor ⓘ

Cytochrome P450 2C9

inhibitor: SVM model
[built on 5940 molecules](#)
[\(training set\)](#)
and tested on 2075 molecules (test set) No
10-fold CV: ACC=0.78 /
AUC=0.85
External: ACC=0.71 /
AUC=0.81

CYP2D6 inhibitor ⓘ

Cytochrome P450 2D6

inhibitor: SVM model
[built on 3664 molecules](#)
[\(training set\)](#)
and tested on 1068 molecules (test set) No
10-fold CV: ACC=0.79 /
AUC=0.85
External: ACC=0.81 /
AUC=0.87

CYP3A4 inhibitor ⓘ

Cytochrome P450 3A4

inhibitor: SVM model
[built on 7518 molecules](#)
[\(training set\)](#)
and tested on 2579 molecules (test set) No
10-fold CV: ACC=0.77 /
AUC=0.85
External: ACC=0.78 /
AUC=0.86

Log K_p (skin permeation) ⓘ

Skin permeation: -12.34 cm/s
[QSPR model](#)
implemented from
[Potts RO and Guy RH. 1992 Pharm. Res.](#)

Druglikeness

Lipinski ⓘ

Lipinski (Pfizer) filter:

implemented from
[Lipinski CA. et al. 2001](#)
[Adv. Drug Deliv. Rev.](#)
MW < 500 No; 2 violations: NorO>10,
NHorOH>5
MLOGP < 4.15
N or O < 10
NH or OH < 5

Ghose ⓘ

Ghose filter:

implemented from
[Ghose AK. et al. 1999 J.](#)
[Comb. Chem.](#)
160 < MW < 480 No; 2 violations: WLOGP<-0.4,
#atoms>70
-0.4 < WLOGP < 5.6
40 < MR < 130
20 < atoms < 70

Veber ⓘ

No; 1 violation: TPSA>140

Veber (GSK) filter:

implemented from
[Veber DF. et al. 2002 J.](#)
[Med. Chem.](#)

[Rotatable bonds < 10](#)
[TPSA < 140](#)

Egan ⓘ

Egan (Pharmacia)

filter: [implemented](#)

[from](#)

[Egan WJ. et al. 2000 J.](#)

[Med. Chem.](#)

[WLOGP < 5.88](#)

[TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge ⓘ

Muegge (Bayer) filter:

[implemented from](#)

[Muegge I. et al. 2001 J.](#)

[Med. Chem.](#)

[200 < MW < 600](#)

[-2 < XLOGP < 5](#)

[TPSA < 150](#)

[Num. rings < 7](#)

[Num. carbon > 4](#)

[Num. heteroatoms > 1](#)

[Num. rotatable bonds <](#)

[15](#)

[H-bond acc. < 10](#)

[H-bond don. < 5](#)

No; 4 violations: XLOGP3<-2, TPSA>150, H-acc>10, H-don>5

Bioavailability Score ⓘ

Abbott Bioavailability

Score: [Probability of F](#)

[> 10% in rat](#)

0.17

[implemented from](#)

[Martin YC. 2005 J.](#)

[Med. Chem.](#)

Medicinal Chemistry

PAINS ⓘ

Pan Assay Interference

Structures:

[implemented from](#)

0 alert

[Baell JB. & Holloway](#)

[GA. 2010 J. Med.](#)

[Chem.](#)

Brenk ⓘ

Structural Alert:

[implemented from](#)

0 alert

[Brenk R. et al. 2008](#)

[ChemMedChem](#)

Leadlikeness ⓘ

Leadlikeness:

[implemented from](#)

[Teague SJ. 1999 Angew.](#)

[Chem. Int. Ed.](#)

No; 1 violation: MW>350

[250 < MW < 350](#)

[XLOGP < 3.5](#)

[Num. rotatable bonds <](#)

[7](#)

Synthetic accessibility ⓘ 6.33

Synthetic accessibility

score: [from 1 \(very](#)

[easy\) to 10 \(very](#)

[difficult\)](#)

[based on 1024](#)

[fragmental contributions](#)

[\(FP2\) modulated by size](#)

[and complexity penalties.](#)

Log $P_{o/w}$ (MLOGP)

MLOGP: [Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.](#)

-2.92

Log $P_{o/w}$ (SILICOS-IT)

SILICOS-IT: [Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com](#)

-3.56

Consensus Log $P_{o/w}$

Consensus Log $P_{o/w}$: [Average of all five predictions](#)

-2.27

BBB permeant

BBB permeation: [according to the yolk of the BOILED-Egg](#) No

P-gp substrate

P-glycoprotein substrate: [SVM model built on 1033 molecules \(training set\) and tested on 415 molecules \(test set\). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94](#) Yes

CYP1A2 inhibitor

Cytochrome P450 1A2 inhibitor: [SVM model built on 9145 molecules \(training set\) and tested on 3000 molecules \(test set\). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91](#) No

CYP2C19 inhibitor

Cytochrome P450 2C19 inhibitor: [SVM model built on 9272 molecules \(training set\) and tested on 3000 molecules \(test set\). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87](#) No

CYP2C9 inhibitor

Cytochrome P450 2C9 inhibitor: [SVM model built on 5940 molecules \(training set\) and tested on 2075 molecules \(test set\). 10-fold CV: ACC=0.78 / AUC=0.85 External: ACC=0.71 / AUC=0.81](#) No

CYP2D6 inhibitor

Cytochrome P450 2D6 inhibitor: [SVM model built on 3664 molecules \(training set\) and tested on 1068 molecules \(test set\). 10-fold CV: ACC=0.79 / AUC=0.85 External: ACC=0.81 / AUC=0.87](#) No

CYP3A4 inhibitor No

Cytochrome P450 3A4 inhibitor: [SVM model built on 7518 molecules \(training set\)](#)

and tested on 2579
 molecules (test set)
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin
 permeation) ?

Skin permeation:
[QSPR model](#) -12.12 cm/s
 implemented from
[Potts RO and Guy RH.](#)
[1992 Pharm. Res.](#)

Druglikeness

Lipinski ?

Lipinski (Pfizer) filter:
 implemented from
[Lipinski CA. et al. 2001](#)
[Adv. Drug Deliv. Rev.](#)
 MW < 500
 MLOGP < 4.15
 N or O < 10
 NH or OH < 5
 No; 2 violations: NorO>10,
 NHorOH>5

Ghose ?

Ghose filter:
 implemented from
[Ghose AK. et al. 1999 J.](#)
[Comb. Chem.](#)
 160 < MW < 480
 -0.4 < WLOGP < 5.6
 40 < MR < 130
 20 < atoms < 70
 No; 2 violations: WLOGP<-0.4,
 #atoms>70

Veber ?

Veber (GSK) filter:
 implemented from
[Veber DF. et al. 2002 J.](#)
[Med. Chem.](#)
 Rotatable bonds < 10
 TPSA < 140
 No; 1 violation: TPSA>140

Egan ?

**Egan (Pharmacia)
 filter:** implemented
 from
[Egan WJ. et al. 2000 J.](#)
[Med. Chem.](#)
 WLOGP < 5.88
 TPSA < 131.6
 No; 1 violation: TPSA>131.6

Muegge ?

Muegge (Bayer) filter:
 implemented from
[Muegge I. et al. 2001 J.](#)
[Med. Chem.](#)
 200 < MW < 600
 -2 < XLOGP < 5
 TPSA < 150
 Num. rings < 7
 Num. carbon > 4
 Num. heteroatoms > 1
 Num. rotatable bonds <
 15
 H-bond acc. < 10
 H-bond don. < 5
 No; 4 violations: XLOGP3<-2,
 TPSA>150, H-acc>10, H-don>5

Bioavailability Score 2

Abbott Bioavailability:**Score: Probability of F**

> 10% in rat 0.17
 implemented from
 Martin YC. 2005 J.
 Med. Chem.

Medicinal Chemistry

PAINS 2

Pan Assay Interference**Structures:**

implemented from 0 alert
 Baell JB. & Holloway
 GA. 2010 J. Med.
 Chem.

Brenk 2

Structural Alert:

implemented from 0 alert
 Brenk R. et al. 2008
 ChemMedChem

Leadlikeness 2

Leadlikeness:

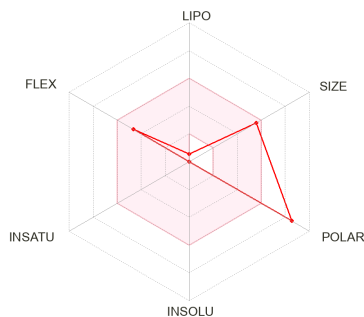
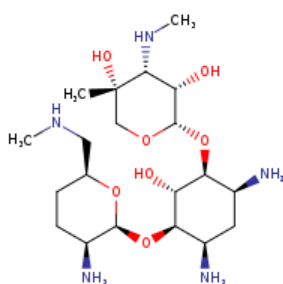
implemented from
 Teague SJ. 1999 Angew.
 Chem. Int. Ed. No; 1 violation: MW>350
 250 < MW < 350
 XLOGP < 3.5
 Num. rotatable bonds <
 7

Synthetic accessibility 2

Synthetic accessibility

score: from 1 (very
 easy) to 10 (very
 difficult)
 based on 1024
 fragmental contributions 6.51
 (FP2) modulated by size
 and complexity penalties,
 trained on 12'782'590
 molecules and tested on
 40 external molecules
 ($r^2 = 0.94$)

Molecule 9



Water Solubility

Log S (ESOL) 2

**ESOL: Topological
 method implemented
 from**
 Delaney JS. 2004 J.
 Chem. Inf. Model.

0.60

Solubility
 Class 2

1.85e+03 mg/ml ; 4.00e+00 mol/l

**Solubility class: Log S
 scale**

Insoluble < -10 < Poorly
 < -6 < Moderately < -4
 < Soluble < -2 Very < 0
 < Highly

CNC[C@@H]1CC[C@@H]([C@@H]
 SMILE (O1)O[C@@H]1[C@H](N)C[C@@H]([C@@H]
 S ([C@H]1O)O[C@@H]1OC[C@]([C@@H]
 ([C@@H]1O)NC)(C)O)N)N

Physicochemical Properties

Formula C20H41N5O7

Molecular weight	463.57 g/mol		Log <i>S</i> (Ali) ⓘ	
Num. heavy atoms	32		Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.	0.96
Num. arom. heavy atoms	0			
Fraction Csp3	1.00			
Num. rotatable bonds	7		Solubility	4.18e+03 mg/ml ; 9.02e+00 mol/l
Num. H-bond acceptors	12		Class ⓘ	
Num. H-bond donors	8		Solubility class: Log <i>S</i> scale	
Molar Refractivity	113.50		Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Highly soluble
TPSA ⓘ				
Topological Polar Surface Area: Calculated from Ertl P. et al. 2000 J. Med. Chem.	199.73 Å²			
		Lipophilicity	Log <i>S</i> (SILICOS-IT) ⓘ	
Log <i>P</i> _{o/w} (iLOGP) ⓘ			SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	0.53
iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.	2.36			
Log <i>P</i> _{o/w} (XLOGP3) ⓘ			Solubility	1.58e+03 mg/ml ; 3.40e+00 mol/l
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.	-4.53		Class ⓘ	
			Solubility class: Log <i>S</i> scale	Soluble
			Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	
Log <i>P</i> _{o/w} (WLOGP) ⓘ				Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-3.72		GI absorption ⓘ	
			Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
Log <i>P</i> _{o/w} (MLOGP) ⓘ			BBB permeant ⓘ	
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-3.14		BBB permeation: according to the yolk of the BOILED-Egg	No
Log <i>P</i> _{o/w} (SILICOS-IT) ⓘ			P-gp substrate ⓘ	
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.79		P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	Yes
Consensus Log <i>P</i> _{o/w} ⓘ	-2.56		CYP1A2 inhibitor ⓘ	No
Consensus Log <i>P</i>_{o/w}: Average of all five			Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90	

[predictions](#)[External: ACC=0.84 /](#)[AUC=0.91](#)

CYP2C19 inhibitor ?

Cytochrome P450**2C19 inhibitor: SVM**[model built on 9272](#)[molecules \(training set\)](#)[and tested on 3000](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.80 /](#)[AUC=0.86](#)[External: ACC=0.80 /](#)[AUC=0.87](#)

CYP2C9 inhibitor ?

Cytochrome P450 2C9**inhibitor: SVM model**[built on 5940 molecules](#)[\(training set\)](#)[and tested on 2075](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.78 /](#)[AUC=0.85](#)[External: ACC=0.71 /](#)[AUC=0.81](#)

CYP2D6 inhibitor ?

Cytochrome P450 2D6**inhibitor: SVM model**[built on 3664 molecules](#)[\(training set\)](#)[and tested on 1068](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.79 /](#)[AUC=0.85](#)[External: ACC=0.81 /](#)[AUC=0.87](#)

CYP3A4 inhibitor ?

Cytochrome P450 3A4**inhibitor: SVM model**[built on 7518 molecules](#)[\(training set\)](#)[and tested on 2579](#)[molecules \(test set\)](#)

No

[10-fold CV: ACC=0.77 /](#)[AUC=0.85](#)[External: ACC=0.78 /](#)[AUC=0.86](#)Log K_p (skin

permeation) ?

Skin permeation:[QSPR model](#)

-12.34 cm/s

[implemented from](#)[Potts RO and Guy RH.](#)[1992 Pharm. Res.](#)

Druglikeness

Lipinski ?

Lipinski (Pfizer) filter:[implemented from](#)[Lipinski CA. et al. 2001](#)[Adv. Drug Deliv. Rev.](#)[MW < 500](#)[MLOGP < 4.15](#)[N or O < 10](#)[NH or OH < 5](#)No; 2 violations: NorO>10,
NHorOH>5

Ghose ?

Ghose filter:[implemented from](#)[Ghose AK. et al. 1999 J.](#)[Comb. Chem.](#)[160 < MW < 480](#)[-0.4 < WLOGP < 5.6](#)[40 < MR < 130](#)[20 < atoms < 70](#)No; 2 violations: WLOGP<-0.4,
#atoms>70

Veber ?

Veber (GSK) filter:[implemented from](#)[Veber DF. et al. 2002 J.](#)[Med. Chem.](#)[Rotatable bonds < 10](#)[TPSA < 140](#)

No; 1 violation: TPSA>140

Egan ?

Egan (Pharmacia)**filter:** [implemented](#)[from](#)[Egan WJ. et al. 2000 J.](#)[Med. Chem.](#)[WLOGP < 5.88](#)[TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge ?

Muegge (Bayer) filter:[implemented from](#)[Muegge I. et al. 2001 J.](#)[Med. Chem.](#)[200 < MW < 600](#)[-2 < XLOGP < 5](#)[TPSA < 150](#)[Num. rings < 7](#)[Num. carbon > 4](#)[Num. heteroatoms > 1](#)[Num. rotatable bonds < 15](#)[15](#)[H-bond acc. < 10](#)[H-bond don. < 5](#)No; 4 violations: XLOGP3<-2,
TPSA>150, H-acc>10, H-don>5

Bioavailability Score ?

Abbott Bioavailability**Score:** [Probability of F](#)[> 10% in rat](#)

0.17

[implemented from](#)[Martin YC. 2005 J.](#)[Med. Chem.](#)

Medicinal Chemistry

PAINS ?

Pan Assay Interference**Structures:**[implemented from](#)

0 alert

[Baell JB. & Holloway.](#)[GA. 2010 J. Med.](#)[Chem.](#)

Brenk ?

Structural Alert:[implemented from](#)

0 alert

[Brenk R. et al. 2008](#)[ChemMedChem](#)

Leadlikeness ?

No; 1 violation: MW>350

Leadlikeness:[implemented from](#)

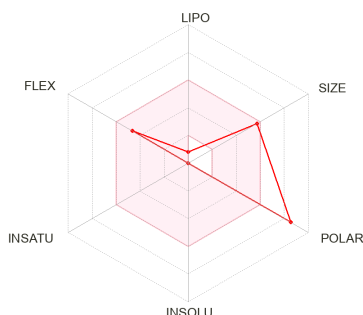
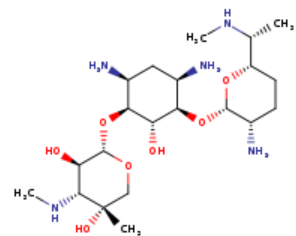
[Teague S.J. 1999 Angew. Chem. Int. Ed. 250 < MW < 350 XLOGP < 3.5 Num. rotatable bonds < 7](#)

Synthetic accessibility [?]

Synthetic accessibility

score: from 1 (very easy) to 10 (very difficult)
based on 1024 fragmental contributions
(FP2) modulated by size and complexity penalties,
trained on 12'782'590 molecules and tested on 40 external molecules
($r^2 = 0.94$)

Molecule 10



SMILES
CN[C@@H]([C@@H]1CC[C@@H]([C@@H](O1)O[C@@H]1[C@H](N)C[C@@H]([C@@H]([C@H]1O)O[C@@H]1OC[C@@]([C@@H]([C@H]1O)NC)(C)O)N)C

Physicochemical Properties

Formula C₂₁H₄₃N₅O₇
Molecular weight 477.60 g/mol
Num. heavy atoms 33
Num. arom. heavy atoms 0
Fraction Csp³ 1.00
Num. rotatable bonds 7
Num. H-bond acceptors 12
Num. H-bond donors 8
Molar Refractivity 118.31
TPSA [?]

Topological Polar Surface Area:

Calculated from 199.73 Å²
Ertl P. et al. 2000 J. Med. Chem.

Lipophilicity
Log P_{o/w} (iLOGP) [?]

iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model. 3.26

Log S (ESOL) [?]

ESOL: Topological method implemented from Delaney JS. 2004 J. Chem. Inf. Model.

Solubility Class [?]

Solubility class: Log S scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Water Solubility

0.24

8.37e+02 mg/ml ; 1.75e+00 mol/l

Log S (Ali) [?]

Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.

Solubility Class [?]

Solubility class: Log S scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

0.51

1.54e+03 mg/ml ; 3.23e+00 mol/l

Log S (SILICOS-IT) [?]

SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com>

Solubility

0.52

1.56e+03 mg/ml ; 3.27e+00 mol/l

Log $P_{o/w}$ (XLOGP3) 2		Class 2	
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry	-4.10	Solubility class: Log S scale Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	
Log $P_{o/w}$ (WLOGP) 2		GI absorption 2	Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-3.33	Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
Log $P_{o/w}$ (MLOGP) 2		BBB permeant 2	
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-2.92	BBB permeation: according to the yolk of the BOILED-Egg	No
Log $P_{o/w}$ (SILICOS-IT) 2		P-gp substrate 2	
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.56	P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	Yes
Consensus Log $P_{o/w}$ 2		CYP1A2 inhibitor 2	
Consensus Log $P_{o/w}$: Average of all five predictions	-2.13	Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91	No
		CYP2C19 inhibitor 2	
		Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87	No
		CYP2C9 inhibitor 2	
		Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set). 10-fold CV: ACC=0.78 / AUC=0.85 External: ACC=0.71 / AUC=0.81	No

CYP2D6 inhibitor ?

Cytochrome P450 2D6**inhibitor:** [SVM model](#)[built on 3664 molecules](#)[\(training set\)](#)

and tested on 1068 No

[molecules \(test set\)](#)

10-fold CV: ACC=0.79 /

[AUC=0.85](#)

External: ACC=0.81 /

[AUC=0.87](#)

CYP3A4 inhibitor ?

Cytochrome P450 3A4**inhibitor:** [SVM model](#)[built on 7518 molecules](#)[\(training set\)](#)

and tested on 2579 No

[molecules \(test set\)](#)

10-fold CV: ACC=0.77 /

[AUC=0.85](#)

External: ACC=0.78 /

[AUC=0.86](#)Log K_p (skin

permeation) ?

Skin permeation:[QSPR model](#)

-12.12 cm/s

[implemented from](#)[Potts RO and Guy RH.](#)[1992 Pharm. Res.](#)

Druglikeness

Lipinski ?

Lipinski (Pfizer) filter:[implemented from](#)[Lipinski CA. et al. 2001](#)[Adv. Drug Deliv. Rev.](#)[MW < 500](#)[MLOGP < 4.15](#)[N or O < 10](#)[NH or OH < 5](#)No; 2 violations: NorO>10,
NHorOH>5

Ghose ?

Ghose filter:[implemented from](#)[Ghose AK. et al. 1999 J.](#)[Comb. Chem.](#)[160 < MW < 480](#)[-0.4 < WLOGP < 5.6](#)[40 < MR < 130](#)[20 < atoms < 70](#)No; 2 violations: WLOGP<-0.4,
#atoms>70

Veber ?

Veber (GSK) filter:[implemented from](#)[Veber DF. et al. 2002 J.](#)[Med. Chem.](#)[Rotatable bonds < 10](#)[TPSA < 140](#)

No; 1 violation: TPSA>140

Egan ?

Egan (Pharmacia)**filter:** [implemented](#)[from](#)[Egan WJ. et al. 2000 J.](#)[Med. Chem.](#)[WLOGP < 5.88](#)[TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge

Muegge (Bayer) filter:

implemented from

[Muegge I. et al. 2001 J.](#)[Med. Chem.](#)[200 < MW < 600](#)[-2 < XLOGP < 5](#)No; 4 violations: XLOGP3 < -2,
TPSA > 150, H-acc > 10, H-don > 5[TPSA < 150](#)[Num. rings < 7](#)[Num. carbon > 4](#)[Num. heteroatoms > 1](#)[Num. rotatable bonds <](#)[15](#)[H-bond acc. < 10](#)[H-bond don. < 5](#)

Bioavailability Score

Abbott Bioavailability**Score: Probability of F**[> 10% in rat](#)

0.17

implemented from

[Martin YC. 2005 J.](#)[Med. Chem.](#)

Medicinal Chemistry

PAINS

Pan Assay Interference**Structures:**

implemented from

0 alert

[Baell JB. & Holloway](#)[GA. 2010 J. Med.](#)[Chem.](#)

Brenk

Structural Alert:

implemented from

0 alert

[Brenk R. et al. 2008](#)[ChemMedChem](#)

Leadlikeness

Leadlikeness:

implemented from

[Teague SJ. 1999 Angew.](#)[Chem. Int. Ed.](#)

No; 1 violation: MW > 350

[250 < MW < 350](#)[XLOGP < 3.5](#)[Num. rotatable bonds <](#)[7](#)

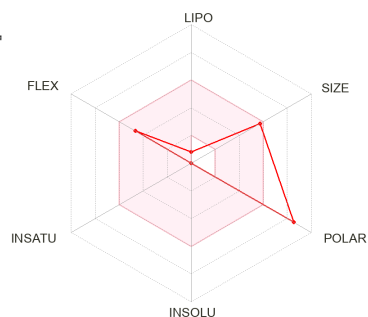
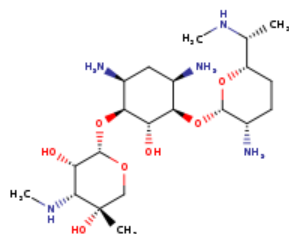
Synthetic accessibility

Synthetic accessibility**score: from 1 (very****easy) to 10 (very****difficult)****based on 1024****fragmental contributions** 6.51**(FP2) modulated by size****and complexity penalties,****trained on 12'782'590****molecules and tested on****40 external molecules****($r^2 = 0.94$)**

Molecule 11



Water Solubility



```

SMILES  CN[C@@H]([C@@H]1CC[C@H]([C@@H]
  (O1)O[C@@H]1[C@H](N)C[C@H]([C@@H]
  [C@H]1O)O[C@@H]1OC[C@]([C@@H]
  ([C@H]1O)NC)(C)O)N)C

```

Physicochemical Properties

Formula	C21H43N5O7
Molecular weight	477.60 g/mol
Num. heavy atoms	33
Num. arom. heavy atoms	0
Fraction Csp3	1.00
Num. rotatable bonds	7
Num. H-bond acceptors	12
Num. H-bond donors	8
Molar Refractivity	118.31
TPSA [Ⓢ]	

Topological Polar Surface Area:

199.73 Å²
 Calculated from
[Ertl P. et al. 2000 J. Med. Chem.](#)

Lipophilicity

Log *P*_{o/w} (iLOGP) [Ⓢ]
 2.68
iLOGP: in-house physics-based method implemented from
[Daina A et al. 2014 J. Chem. Inf. Model.](#)

Log *P*_{o/w} (XLOGP3) [Ⓢ]
 -4.10
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.

Log *P*_{o/w} (WLOGP) [Ⓢ]
 -3.33
WLOGP: Atomistic method implemented from
[Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.](#)

Log *P*_{o/w} (MLOGP) [Ⓢ]
 -2.92
MLOGP: Topological method implemented from
[Moriguchi I. et al. 1992 Chem. Pharm. Bull.](#)
[Moriguchi I. et al. 1994](#)

Log *S* (ESOL) [Ⓢ]
ESOL: Topological method implemented from
[Delaney JS. 2004 J. Chem. Inf. Model.](#) 0.24

Solubility Class [Ⓢ]
 8.37e+02 mg/ml ; 1.75e+00 mol/l

Solubility class: Log *S* scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log *S* (Ali) [Ⓢ]
Ali: Topological method implemented from
[Ali J. et al. 2012 J. Chem. Inf. Model.](#) 0.51

Solubility Class [Ⓢ]
 1.54e+03 mg/ml ; 3.23e+00 mol/l

Solubility class: Log *S* scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log *S* (SILICOS-IT) [Ⓢ]
SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT.
<http://www.silicos-it.com> 0.52

Solubility Class [Ⓢ]
 1.56e+03 mg/ml ; 3.27e+00 mol/l

Solubility class: Log *S* scale
Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Pharmacokinetics

GI absorption [Ⓢ]
Gastrointestinal absorption: according to the white of the BOILED-Egg Low

BBB permeant [Ⓢ]
BBB permeation: according to the yolk of the BOILED-Egg No

P-gp substrate [Ⓢ]
P-glycoprotein substrate: SVM model built on 1033 molecules Yes

[Chem. Pharm. Bull.](#)
[Lipinski PA, et al. 2001](#)
[Adv. Drug. Deliv. Rev.](#)

Log $P_{o/w}$ (SILICOS-IT)

SILICOS-IT: Hybrid
fragmental/topological
method calculated by
FILTER-IT program, -3.56
version 1.0.2, courtesy
of SILICOS-IT,
[http://www.silicos-
it.com](http://www.silicos-it.com)

Consensus Log $P_{o/w}$

Consensus Log $P_{o/w}$: -2.25
[Average of all five
predictions](#)

(training set)
and tested on 415
molecules (test set)
[10-fold CV: ACC=0.72 /](#)
[AUC=0.77](#)
[External: ACC=0.88 /](#)
[AUC=0.94](#)
CYP1A2 inhibitor

Cytochrome P450 1A2
inhibitor: SVM model
built on 9145 molecules
(training set)
and tested on 3000 No
molecules (test set)
[10-fold CV: ACC=0.83 /](#)
[AUC=0.90](#)
[External: ACC=0.84 /](#)
[AUC=0.91](#)

CYP2C19 inhibitor

Cytochrome P450
2C19 inhibitor: SVM
model built on 9272
molecules (training set)
and tested on 3000 No
molecules (test set)
[10-fold CV: ACC=0.80 /](#)
[AUC=0.86](#)
[External: ACC=0.80 /](#)
[AUC=0.87](#)

CYP2C9 inhibitor

Cytochrome P450 2C9
inhibitor: SVM model
built on 5940 molecules
(training set)
and tested on 2075 No
molecules (test set)
[10-fold CV: ACC=0.78 /](#)
[AUC=0.85](#)
[External: ACC=0.71 /](#)
[AUC=0.81](#)

CYP2D6 inhibitor

Cytochrome P450 2D6
inhibitor: SVM model
built on 3664 molecules
(training set)
and tested on 1068 No
molecules (test set)
[10-fold CV: ACC=0.79 /](#)
[AUC=0.85](#)
[External: ACC=0.81 /](#)
[AUC=0.87](#)

CYP3A4 inhibitor

Cytochrome P450 3A4
inhibitor: SVM model
built on 7518 molecules
(training set)
and tested on 2579 No
molecules (test set)
[10-fold CV: ACC=0.77 /](#)
[AUC=0.85](#)
[External: ACC=0.78 /](#)
[AUC=0.86](#)

Log K_p (skin
permeation) -12.12 cm/s

Skin permeation:
QSPR model

[implemented from Potts RO and Guy RH. 1992 Pharm. Res.](#)

Druglikeness

Lipinski **Lipinski (Pfizer) filter:**

[implemented from Lipinski CA. et al. 2001 Adv. Drug Deliv. Rev. MW < 500 MLOGP < 4.15 N or O < 10 NH or OH < 5](#)

No; 2 violations: NorO>10, NHorOH>5

Ghose **Ghose filter:**

[implemented from Ghose AK. et al. 1999 J. Comb. Chem. 160 < MW < 480 -0.4 < WLOGP < 5.6 40 < MR < 130 20 < atoms < 70](#)

No; 2 violations: WLOGP<-0.4, #atoms>70

Veber **Veber (GSK) filter:**


[implemented from Veber DF. et al. 2002 J. Med. Chem. Rotatable bonds < 10 TPSA < 140](#)

No; 1 violation: TPSA>140

Egan **Egan (Pharmacia) filter:**


[implemented from Egan WJ. et al. 2000 J. Med. Chem. WLOGP < 5.88 TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge **Muegge (Bayer) filter:**

[implemented from Muegge I. et al. 2001 J. Med. Chem. 200 < MW < 600 -2 < XLOGP < 5 TPSA < 150 Num. rings < 7 Num. carbon > 4 Num. heteroatoms > 1 Num. rotatable bonds < 15 H-bond acc. < 10 H-bond don. < 5](#)

No; 4 violations: XLOGP3<-2, TPSA>150, H-acc>10, H-don>5

Bioavailability Score **Abbott Bioavailability**

Score: Probability of F
[> 10% in rat implemented from Martin YC. 2005 J. Med. Chem.](#)

0.17

Medicinal Chemistry

PAINS 

0 alert

Pan Assay Interference Structures:

[implemented from Baell JB. & Holloway GA. 2010 J. Med. Chem.](#)

Brenk ?

Structural Alert:
[implemented from Brenk R. et al. 2008 ChemMedChem](#) 0 alert

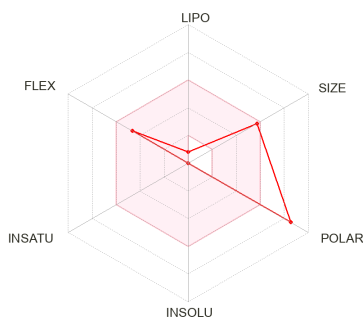
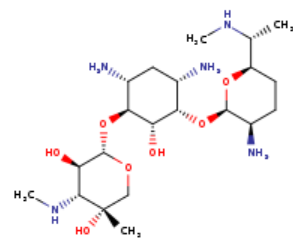
Leadlikeness ?

Leadlikeness:
[implemented from Teague SJ. 1999 Angew. Chem. Int. Ed.](#) No; 1 violation: MW>350
[250 < MW < 350](#)
[XLOGP < 3.5](#)
[Num. rotatable bonds < 7](#)

Synthetic accessibility ?

Synthetic accessibility
score: from 1 (very easy) to 10 (very difficult)
 based on 1024 fragmental contributions (FP2) modulated by size and complexity penalties, trained on 12'782'590 molecules and tested on 40 external molecules ($r^2 = 0.94$)

Molecule 12



SMILES
CN[C@@H]([C@H]1CC[C@H]([C@H](O1)O[C@H]1[C@@H](N)C[C@H]([C@@H]([C@H]1O)O[C@@H]1OC[C@]([C@@H]([C@H]1O)NC)(C)O)N)N)C

Physicochemical Properties

Formula C21H43N5O7
 Molecular weight 477.60 g/mol
 Num. heavy atoms 33
 Num. arom. heavy atoms 0
 Fraction Csp3 1.00
 Num. rotatable bonds 7
 Num. H-bond acceptors 12
 Num. H-bond donors 8
 Molar Refractivity 118.31
 TPSA ? 199.73 Å²

Topological Polar Surface Area:

Log *S* (ESOL) ?

ESOL: Topological method implemented from Delaney JS. 2004 J. Chem. Inf. Model.

Water Solubility

0.24

Solubility Class ? 8.37e+02 mg/ml ; 1.75e+00 mol/l

Solubility class: Log *S* scale
 Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log *S* (Ali) ?

Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.

0.51

Solubility Class ? 1.54e+03 mg/ml ; 3.23e+00 mol/l

Solubility class: Log *S* scale
 Insoluble < -10 < Poorly < -6 < Moderately < -4

Calculated from
[Ertl P. et al. 2000 J.
Med. Chem.](#)

< Soluble < -2 Very < 0
< Highly

Lipophilicity
Log $P_{o/w}$ (iLOGP) ?

Log S (SILICOS-IT) ?

iLOGP: in-house
physics-based method
implemented from
[Daina A et al. 2014 J.
Chem. Inf. Model.](#)

2.38

SILICOS-IT:
[Fragmental method
calculated by
FILTER-IT program,
version 1.0.2, courtesy
of SILICOS-IT,
\[http://www.silicos-
it.com\]\(http://www.silicos-
it.com\)](#) 0.52

Log $P_{o/w}$ (XLOGP3) ?

Solubility 1.56e+03 mg/ml ; 3.27e+00 mol/l
Class ?

XLOGP3: Atomistic
and knowledge-based
method calculated by
XLOGP program,
version 3.2.2, courtesy
of CCBG, Shanghai
Institute of Organic
Chemistry.

-4.10

Solubility class: Log S
scale
[Insoluble < -10 < Poorly](#) Soluble
[< -6 < Moderately < -4](#)
[< Soluble < -2 Very < 0](#)
[< Highly](#)

Log $P_{o/w}$ (WLOGP) ?

Pharmacokinetics
GI absorption ?

WLOGP: Atomistic
method implemented
from
[Wildman SA and
Crippen GM. 1999 J.
Chem. Inf. Model.](#)

-3.33

Gastrointestinal
absorption: according
[to the white of the
BOILED-Egg](#) Low

Log $P_{o/w}$ (MLOGP) ?

BBB permeant ?

MLOGP: Topological
method implemented
from
[Moriguchi I. et al. 1992
Chem. Pharm. Bull.](#)
[Moriguchi I. et al. 1994
Chem. Pharm. Bull.](#)
[Lipinski PA. et al. 2001
Adv. Drug. Deliv. Rev.](#)

-2.92

BBB permeation:
[according to the yolk of
the BOILED-Egg](#) No

Log $P_{o/w}$ (SILICOS-IT)
?

P-gp substrate ?

SILICOS-IT: Hybrid
fragmental/topological
method calculated by
FILTER-IT program,
version 1.0.2, courtesy
of SILICOS-IT,
[http://www.silicos-
it.com](http://www.silicos-
it.com)

-3.56

P-glycoprotein
substrate: SVM model
[built on 1033 molecules
\(training set\)
and tested on 415
molecules \(test set\).](#) Yes
[10-fold CV: ACC=0.72 /
AUC=0.77](#)
[External: ACC=0.88 /
AUC=0.94](#)

Consensus Log $P_{o/w}$?

CYP1A2 inhibitor ?


Consensus Log $P_{o/w}$:
Average of all five
predictions

-2.31

Cytochrome P450 1A2
inhibitor: SVM model
[built on 9145 molecules
\(training set\)
and tested on 3000
molecules \(test set\).](#) No
[10-fold CV: ACC=0.83 /
AUC=0.90](#)
[External: ACC=0.84 /
AUC=0.91](#)


CYP2C19 inhibitor ?

Cytochrome P450
2C19 inhibitor: SVM
[model built on 9272
molecules \(training set\)
and tested on 3000
molecules \(test set\).](#) No
[10-fold CV: ACC=0.80 /
AUC=0.86](#)
[External: ACC=0.80 /
AUC=0.87](#)

CYP2C9 inhibitor **Cytochrome P450 2C9**


inhibitor: SVM model
 built on 5940 molecules (training set)
 and tested on 2075 molecules (test set)
 10-fold CV: ACC=0.78 / AUC=0.85
 External: ACC=0.71 / AUC=0.81

No

CYP2D6 inhibitor **Cytochrome P450 2D6**


inhibitor: SVM model
 built on 3664 molecules (training set)
 and tested on 1068 molecules (test set)
 10-fold CV: ACC=0.79 / AUC=0.85
 External: ACC=0.81 / AUC=0.87

No

CYP3A4 inhibitor **Cytochrome P450 3A4**

inhibitor: SVM model
 built on 7518 molecules (training set)
 and tested on 2579 molecules (test set)
 10-fold CV: ACC=0.77 / AUC=0.85
 External: ACC=0.78 / AUC=0.86

No

Log K_p (skin permeation) 

Skin permeation:

QSPR model implemented from Potts RO and Guy RH. 1992 Pharm. Res.

-12.12 cm/s

Druglikeness

Lipinski **Lipinski (Pfizer) filter:**

implemented from Lipinski CA. et al. 2001 Adv. Drug Deliv. Rev. MW < 500
 MLOGP < 4.15
 N or O < 10
 NH or OH < 5

No; 2 violations: NorO>10, NHorOH>5

Ghose **Ghose filter:**

implemented from Ghose AK. et al. 1999 J. Comb. Chem. 160 < MW < 480
 -0.4 < WLOGP < 5.6
 40 < MR < 130
 20 < atoms < 70

No; 2 violations: WLOGP<-0.4, #atoms>70

Veber 

No; 1 violation: TPSA>140

Veber (GSK) filter:

implemented from Veber DF. et al. 2002 J. Med. Chem.

Log $P_{o/w}$ (MLOGP)

MLOGP: [Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull.](#) -2.92
[Moriguchi I. et al. 1994 Chem. Pharm. Bull.](#)
[Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.](#)

Log $P_{o/w}$ (SILICOS-IT)

SILICOS-IT: [Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT.](#) -3.56
<http://www.silicos-it.com>

Consensus Log $P_{o/w}$

Consensus Log $P_{o/w}$: -2.31
[Average of all five predictions](#)

BBB permeant

BBB permeation: No
[according to the yolk of the BOILED-Egg](#)

P-gp substrate

P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set) Yes
 10-fold CV: ACC=0.72 / AUC=0.77
 External: ACC=0.88 / AUC=0.94

CYP1A2 inhibitor

Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set) No
 10-fold CV: ACC=0.83 / AUC=0.90
 External: ACC=0.84 / AUC=0.91

CYP2C19 inhibitor

Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set) No
 10-fold CV: ACC=0.80 / AUC=0.86
 External: ACC=0.80 / AUC=0.87

CYP2C9 inhibitor

Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set) No
 10-fold CV: ACC=0.78 / AUC=0.85
 External: ACC=0.71 / AUC=0.81

CYP2D6 inhibitor

Cytochrome P450 2D6 inhibitor: SVM model built on 3664 molecules (training set) and tested on 1068 molecules (test set) No
 10-fold CV: ACC=0.79 / AUC=0.85
 External: ACC=0.81 / AUC=0.87

CYP3A4 inhibitor

Cytochrome P450 3A4 inhibitor: SVM model built on 7518 molecules (training set) No

and tested on 2579
 molecules (test set)
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin
 permeation) ?

Skin permeation:

QSPR model -12.12 cm/s
 implemented from
 Potts RO and Guy RH.
 1992 Pharm. Res.

Druglikeness

Lipinski ?

Lipinski (Pfizer) filter:

implemented from
 Lipinski CA. et al. 2001
 Adv. Drug Deliv. Rev.
 MW < 500
 MLOGP < 4.15
 N or O < 10
 NH or OH < 5

No; 2 violations: NorO>10,
 NHorOH>5

Ghose ?

Ghose filter:

implemented from
 Ghose AK. et al. 1999 J.
 Comb. Chem.
 160 < MW < 480
 -0.4 < WLOGP < 5.6
 40 < MR < 130
 20 < atoms < 70

No; 2 violations: WLOGP<-0.4,
 #atoms>70

Veber ?

Veber (GSK) filter:

implemented from
 Veber DF. et al. 2002 J.
 Med. Chem.
 Rotatable bonds < 10
 TPSA < 140

No; 1 violation: TPSA>140

Egan ?

Egan (Pharmacia)

filter: implemented
 from
 Egan WJ. et al. 2000 J.
 Med. Chem.
 WLOGP < 5.88
 TPSA < 131.6

No; 1 violation: TPSA>131.6

Muegge ?

Muegge (Bayer) filter:


implemented from
 Muegge I. et al. 2001 J.
 Med. Chem.
 200 < MW < 600
 -2 < XLOGP < 5
 TPSA < 150
 Num. rings < 7
 Num. carbon > 4
 Num. heteroatoms > 1
 Num. rotatable bonds < 15
 H-bond acc. < 10
 H-bond don. < 5

No; 4 violations: XLOGP3<-2,
 TPSA>150, H-acc>10, H-don>5


Molecular weight	477.60 g/mol	Log <i>S</i> (Ali)	
Num. heavy atoms	33	Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.	0.51
Num. arom. heavy atoms	0		
Fraction Csp3	1.00		
Num. rotatable bonds	7	Solubility	1.54e+03 mg/ml ; 3.23e+00 mol/l
Num. H-bond acceptors	12	Class	
Num. H-bond donors	8	Solubility class: Log <i>S</i> scale	
Molar Refractivity	118.31	Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Highly soluble
TPSA			
Topological Polar Surface Area: Calculated from Ertl P. et al. 2000 J. Med. Chem.	199.73 Å ²		
	Lipophilicity	Log <i>S</i> (SILICOS-IT)	
Log <i>P</i> _{o/w} (iLOGP)		SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	0.52
iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.	1.90		
Log <i>P</i> _{o/w} (XLOGP3)		Solubility	1.56e+03 mg/ml ; 3.27e+00 mol/l
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.	-4.10	Class	
		Solubility class: Log <i>S</i> scale	
		Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Soluble
Log <i>P</i> _{o/w} (WLOGP)			Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-3.33	GI absorption	
		Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
Log <i>P</i> _{o/w} (MLOGP)		BBB permeant	
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-2.92	BBB permeation: according to the yolk of the BOILED-Egg	No
		P-gp substrate	
Log <i>P</i> _{o/w} (SILICOS-IT)		P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	Yes
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.56	CYP1A2 inhibitor	No
		Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90	
Consensus Log <i>P</i> _{o/w}	-2.40		
Consensus Log <i>P</i>_{o/w}: Average of all five			

[predictions](#)


External: ACC=0.84 /
 AUC=0.91

CYP2C19 inhibitor 


**Cytochrome P450
 2C19 inhibitor:** SVM
 model built on 9272
 molecules (training set)
 and tested on 3000 molecules (test set) No
 10-fold CV: ACC=0.80 /
 AUC=0.86
 External: ACC=0.80 /
 AUC=0.87

CYP2C9 inhibitor 


**Cytochrome P450 2C9
 inhibitor:** SVM model
 built on 5940 molecules
 (training set)
 and tested on 2075 molecules (test set) No
 10-fold CV: ACC=0.78 /
 AUC=0.85
 External: ACC=0.71 /
 AUC=0.81

CYP2D6 inhibitor 

**Cytochrome P450 2D6
 inhibitor:** SVM model
 built on 3664 molecules
 (training set)
 and tested on 1068 molecules (test set) No
 10-fold CV: ACC=0.79 /
 AUC=0.85
 External: ACC=0.81 /
 AUC=0.87

CYP3A4 inhibitor 

**Cytochrome P450 3A4
 inhibitor:** SVM model
 built on 7518 molecules
 (training set)
 and tested on 2579 molecules (test set) No
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin
 permeation) 

Skin permeation: -12.12 cm/s
 QSPR model
 implemented from
 Potts RO and Guy RH.
 1992 Pharm. Res.

Druglikeness

Lipinski 

Lipinski (Pfizer) filter:
 implemented from
 Lipinski CA. et al. 2001
 Adv. Drug Deliv. Rev.
 MW < 500
 MLOGP < 4.15
 N or O < 10
 NH or OH < 5
 No; 2 violations: NorO>10,
 NHorOH>5

method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.		Class [?]	
Log $P_{o/w}$ (WLOGP) [?]		Solubility class: Log S scale Insoluble < -10 < Poorly Soluble < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-3.33	GI absorption [?]	Pharmacokinetics
Log $P_{o/w}$ (MLOGP) [?]		Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-2.92	BBB permeant [?]	
Log $P_{o/w}$ (SILICOS-IT) [?]		BBB permeation: according to the yolk of the BOILED-Egg	No
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT. http://www.silicos-it.com	-3.56	P-gp substrate [?]	
Consensus Log $P_{o/w}$ [?]		P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	Yes
Consensus Log $P_{o/w}$: Average of all five predictions	-2.40	CYP1A2 inhibitor [?]	
		Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91	No
		CYP2C19 inhibitor [?]	
		Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87	No
		CYP2C9 inhibitor [?]	
		Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set). 10-fold CV: ACC=0.78 / AUC=0.85 External: ACC=0.71 / AUC=0.81	No

CYP2D6 inhibitor ⓘ

Cytochrome P450 2D6

inhibitor: SVM model
 built on 3664 molecules
 (training set) and tested on 1068
 molecules (test set) No
 10-fold CV: ACC=0.79 /
 AUC=0.85
 External: ACC=0.81 /
 AUC=0.87

CYP3A4 inhibitor ⓘ

Cytochrome P450 3A4

inhibitor: SVM model
 built on 7518 molecules
 (training set) and tested on 2579
 molecules (test set) No
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin permeation) ⓘ

Skin permeation:
 QSPR model -12.12 cm/s
 implemented from
 Potts RO and Guy RH.
 1992 Pharm. Res.

Druglikeness

Lipinski ⓘ

Lipinski (Pfizer) filter:

implemented from
 Lipinski CA. et al. 2001
 Adv. Drug Deliv. Rev.
 MW < 500 No; 2 violations: NorO>10,
 NHorOH>5
 MLOGP < 4.15
 N or O < 10
 NH or OH < 5

Ghose ⓘ

Ghose filter:

implemented from
 Ghose AK. et al. 1999 J.
 Comb. Chem. No; 2 violations: WLOGP<-0.4,
 #atoms>70
 160 < MW < 480
 -0.4 < WLOGP < 5.6
 40 < MR < 130
 20 < atoms < 70

Veber ⓘ

Veber (GSK) filter:

implemented from
 Veber DF. et al. 2002 J.
 Med. Chem. No; 1 violation: TPSA>140
 Rotatable bonds < 10
 TPSA < 140

Egan ⓘ

Egan (Pharmacia)

filter: implemented
 from
 Egan WJ. et al. 2000 J.
 Med. Chem. No; 1 violation: TPSA>131.6
 WLOGP < 5.88
 TPSA < 131.6

Muegge [?]

Muegge (Bayer) filter:
[implemented from](#)
[Muegge I. et al. 2001 J. Med. Chem.](#)
[200 < MW < 600](#)
[-2 < XLOGP < 5](#)
[TPSA < 150](#)
[Num. rings < 7](#)
[Num. carbon > 4](#)
[Num. heteroatoms > 1](#)
[Num. rotatable bonds < 15](#)
[H-bond acc. < 10](#)
[H-bond don. < 5](#)

No; 4 violations: XLOGP3<-2,
TPSA>150, H-acc>10, H-don>5

Bioavailability Score [?]

Abbott Bioavailability
Score: Probability of F
[> 10% in rat](#)
[implemented from](#)
[Martin YC. 2005 J. Med. Chem.](#)

0.17

Medicinal Chemistry

PAINS [?]

Pan Assay Interference
Structures:
[implemented from](#)
[Baell JB. & Holloway GA. 2010 J. Med. Chem.](#)

0 alert

Brenk [?]

Structural Alert:
[implemented from](#)
[Brenk R. et al. 2008](#)
[ChemMedChem](#)

0 alert

Leadlikeness [?]

Leadlikeness:
[implemented from](#)
[Teague SJ. 1999 Angew. Chem. Int. Ed.](#)
[250 < MW < 350](#)
[XLOGP < 3.5](#)
[Num. rotatable bonds < 7](#)

No; 1 violation: MW>350

Synthetic accessibility [?]

Synthetic accessibility
score: from 1 (very easy) to 10 (very difficult)
[based on 1024](#)
[fragmental contributions](#)
[\(FP2\) modulated by size](#)
[and complexity penalties,](#)
[trained on 12'782'590](#)
[molecules and tested on](#)
[40 external molecules](#)
[\(r² = 0.94\)](#)

6.51

Molecule 16



Water Solubility



[Chem. Pharm. Bull.](#)
[Lipinski PA, et al. 2001](#)
[Adv. Drug. Deliv. Rev.](#)

Log $P_{o/w}$ (SILICOS-IT)

?

SILICOS-IT: Hybrid
 fragmental/topological
 method calculated by
 FILTER-IT program, -3.56
 version 1.0.2, courtesy
 of SILICOS-IT,
[http://www.silicos-
 it.com](http://www.silicos-it.com)

Consensus Log $P_{o/w}$?

Consensus Log $P_{o/w}$: -2.14
 Average of all five
 predictions

(training set)
 and tested on 415
 molecules (test set)
 10-fold CV: ACC=0.72 /
 AUC=0.77
 External: ACC=0.88 /
 AUC=0.94

CYP1A2 inhibitor ?

Cytochrome P450 1A2
inhibitor: SVM model
 built on 9145 molecules
 (training set)
 and tested on 3000 No
 molecules (test set)
 10-fold CV: ACC=0.83 /
 AUC=0.90
 External: ACC=0.84 /
 AUC=0.91

CYP2C19 inhibitor ?

Cytochrome P450
2C19 inhibitor: SVM
 model built on 9272
 molecules (training set)
 and tested on 3000 No
 molecules (test set)
 10-fold CV: ACC=0.80 /
 AUC=0.86
 External: ACC=0.80 /
 AUC=0.87

CYP2C9 inhibitor ?

Cytochrome P450 2C9
inhibitor: SVM model
 built on 5940 molecules
 (training set)
 and tested on 2075 No
 molecules (test set)
 10-fold CV: ACC=0.78 /
 AUC=0.85
 External: ACC=0.71 /
 AUC=0.81

CYP2D6 inhibitor ?

Cytochrome P450 2D6
inhibitor: SVM model
 built on 3664 molecules
 (training set)
 and tested on 1068 No
 molecules (test set)
 10-fold CV: ACC=0.79 /
 AUC=0.85
 External: ACC=0.81 /
 AUC=0.87

CYP3A4 inhibitor ?

Cytochrome P450 3A4
inhibitor: SVM model
 built on 7518 molecules
 (training set)
 and tested on 2579 No
 molecules (test set)
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin
 permeation) ? -12.12 cm/s

Skin permeation:
 QSPR model

[implemented from Potts RO and Guy RH. 1992 Pharm. Res.](#)

Druglikeness

Lipinski 

Lipinski (Pfizer) filter:

implemented from
[Lipinski CA. et al. 2001 Adv. Drug Deliv. Rev.](#) No; 2 violations: NorO>10,
[MW < 500](#) NHorOH>5
[MLOGP < 4.15](#)
[N or O < 10](#)
[NH or OH < 5](#)

Ghose 

Ghose filter:

implemented from
[Ghose AK. et al. 1999 J. Comb. Chem.](#) No; 2 violations: WLOGP<-0.4,
[160 < MW < 480](#) #atoms>70
[-0.4 < WLOGP < 5.6](#)
[40 < MR < 130](#)
[20 < atoms < 70](#)

Veber 


Veber (GSK) filter:

implemented from
[Veber DF. et al. 2002 J. Med. Chem.](#) No; 1 violation: TPSA>140
[Rotatable bonds < 10](#)
[TPSA < 140](#)

Egan 


Egan (Pharmacia) filter:

implemented from
[Egan WJ. et al. 2000 J. Med. Chem.](#) No; 1 violation: TPSA>131.6
[WLOGP < 5.88](#)
[TPSA < 131.6](#)

Muegge 

Muegge (Bayer) filter:

implemented from
[Muegge I. et al. 2001 J. Med. Chem.](#) No; 4 violations: XLOGP3<-2,
[200 < MW < 600](#) TPSA>150, H-acc>10, H-don>5
[-2 < XLOGP < 5](#)
[TPSA < 150](#)
[Num. rings < 7](#)
[Num. carbon > 4](#)
[Num. heteroatoms > 1](#)
[Num. rotatable bonds < 15](#)
[H-bond acc. < 10](#)
[H-bond don. < 5](#)

Bioavailability Score 

Abbott Bioavailability

Score: Probability of F 0.17
[> 10% in rat](#)
implemented from
[Martin YC. 2005 J. Med. Chem.](#)

Medicinal Chemistry

PAINS 

0 alert

Pan Assay Interference Structures:

Calculated from
[Ertl P. et al. 2000 J. Med. Chem.](#)

< Soluble < -2 Very < 0
 < Highly

Lipophilicity

Log *S* (SILICOS-IT) ?

Log *P*_{o/w} (iLOGP) ?

SILICOS-IT:
[Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com](#) 0.52

iLOGP: in-house physics-based method implemented from [Daina A et al. 2014 J. Chem. Inf. Model.](#) 2.58

Log *P*_{o/w} (XLOGP3) ?

Solubility Class ? 1.56e+03 mg/ml ; 3.27e+00 mol/l

XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry. -4.10

Solubility class: Log *S* scale
 Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log *P*_{o/w} (WLOGP) ?

GI absorption ?

WLOGP: Atomistic method implemented from [Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.](#) -3.33

Gastrointestinal absorption: according to the white of the BOILED-Egg Low

Log *P*_{o/w} (MLOGP) ?

BBB permeant ?

MLOGP: Topological method implemented from [Moriguchi I. et al. 1992 Chem. Pharm. Bull.](#), [Moriguchi I. et al. 1994 Chem. Pharm. Bull.](#), [Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.](#) -2.92

BBB permeation: according to the yolk of the BOILED-Egg No

Log *P*_{o/w} (SILICOS-IT) ?

P-gp substrate ?

SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com> -3.56

P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94 Yes

Consensus Log *P*_{o/w} ?

CYP1A2 inhibitor ?

Consensus Log *P*_{o/w}: Average of all five predictions -2.26

Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91 No

CYP2C19 inhibitor ?

Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87 No

CYP2C9 inhibitor ⓘ

Cytochrome P450 2C9

inhibitor: [SVM model](#)
[built on 5940 molecules](#)
[\(training set\)](#)
and tested on 2075
[molecules \(test set\)](#)
10-fold CV: ACC=0.78 /
[AUC=0.85](#)
External: ACC=0.71 /
[AUC=0.81](#)

No

CYP2D6 inhibitor ⓘ

Cytochrome P450 2D6

inhibitor: [SVM model](#)
[built on 3664 molecules](#)
[\(training set\)](#)
and tested on 1068
[molecules \(test set\)](#)
10-fold CV: ACC=0.79 /
[AUC=0.85](#)
External: ACC=0.81 /
[AUC=0.87](#)

No

CYP3A4 inhibitor ⓘ

Cytochrome P450 3A4

inhibitor: [SVM model](#)
[built on 7518 molecules](#)
[\(training set\)](#)
and tested on 2579
[molecules \(test set\)](#)
10-fold CV: ACC=0.77 /
[AUC=0.85](#)
External: ACC=0.78 /
[AUC=0.86](#)

No

Log K_p (skin permeation) ⓘ

Skin permeation:
[QSPR model](#)
implemented from
[Potts RO and Guy RH.](#)
[1992 Pharm. Res.](#)

-12.12 cm/s

Druglikeness

Lipinski ⓘ

Lipinski (Pfizer) filter:

[implemented from](#)
[Lipinski CA. et al. 2001](#)
[Adv. Drug Deliv. Rev.](#)
[MW < 500](#)
[MLOGP < 4.15](#)
[N or O < 10](#)
[NH or OH < 5](#)

No; 2 violations: NorO>10,
NHorOH>5

Ghose ⓘ

Ghose filter:

[implemented from](#)
[Ghose AK. et al. 1999 J.](#)
[Comb. Chem.](#)
[160 < MW < 480](#)
[-0.4 < WLOGP < 5.6](#)
[40 < MR < 130](#)
[20 < atoms < 70](#)

No; 2 violations: WLOGP<-0.4,
#atoms>70

Veber ⓘ


No; 1 violation: TPSA>140

Veber (GSK) filter:

[implemented from](#)
[Veber DE. et al. 2002 J.](#)
[Med. Chem.](#)

Log $P_{o/w}$ (MLOGP) ?	BBB permeant ?
<p>MLOGP: Topological method implemented from</p> <p>Moriguchi I. et al. 1992 Chem. Pharm. Bull.</p> <p>Moriguchi I. et al. 1994 Chem. Pharm. Bull.</p> <p>Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.</p>	<p>BBB permeation: according to the yolk of the BOILED-Egg No</p>
-2.92	
Log $P_{o/w}$ (SILICOS-IT) ?	P-gp substrate ?
<p>SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT. http://www.silicos-it.com</p>	<p>P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94 Yes</p>
-3.56	
Consensus Log $P_{o/w}$?	CYP1A2 inhibitor ?
<p>Consensus Log $P_{o/w}$: Average of all five predictions</p>	<p>Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91 No</p>
-2.25	
	CYP2C19 inhibitor ?
	<p>Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87 No</p>
	CYP2C9 inhibitor ?
	<p>Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set). 10-fold CV: ACC=0.78 / AUC=0.85 External: ACC=0.71 / AUC=0.81 No</p>
	CYP2D6 inhibitor ?
	<p>Cytochrome P450 2D6 inhibitor: SVM model built on 3664 molecules (training set) and tested on 1068 molecules (test set). 10-fold CV: ACC=0.79 / AUC=0.85 External: ACC=0.81 / AUC=0.87 No</p>
	CYP3A4 inhibitor ?
	<p>Cytochrome P450 3A4 inhibitor: SVM model built on 7518 molecules (training set). No</p>

and tested on 2579
 molecules (test set)
 10-fold CV: ACC=0.77 /
 AUC=0.85
 External: ACC=0.78 /
 AUC=0.86

Log K_p (skin
 permeation) 

Skin permeation:

[QSPR model](#) -12.12 cm/s
 implemented from
[Potts RO and Guy RH.](#)
[1992 Pharm. Res.](#)

Druglikeness

Lipinski 

Lipinski (Pfizer) filter:

implemented from
[Lipinski CA. et al. 2001](#)
[Adv. Drug Deliv. Rev.](#) No; 2 violations: NorO>10,
 MW < 500 NHorOH>5
[MLOGP < 4.15](#)
[N or O < 10](#)
[NH or OH < 5](#)

Ghose 

Ghose filter:

implemented from
[Ghose AK. et al. 1999 J.](#)
[Comb. Chem.](#) No; 2 violations: WLOGP<-0.4,
 #atoms>70
[160 < MW < 480](#)
[-0.4 < WLOGP < 5.6](#)
[40 < MR < 130](#)
[20 < atoms < 70](#)

Veber 


Veber (GSK) filter:

implemented from
[Veber DF. et al. 2002 J.](#)
[Med. Chem.](#) No; 1 violation: TPSA>140
[Rotatable bonds < 10](#)
[TPSA < 140](#)

Egan 

**Egan (Pharmacia)
 filter:** implemented

from
[Egan WJ. et al. 2000 J.](#)
[Med. Chem.](#) No; 1 violation: TPSA>131.6
[WLOGP < 5.88](#)
[TPSA < 131.6](#)

Muegge 

Muegge (Bayer) filter:

implemented from
[Muegge I. et al. 2001 J.](#)
[Med. Chem.](#)
[200 < MW < 600](#)
[-2 < XLOGP < 5](#) No; 4 violations: XLOGP3<-2,
 TPSA < 150 TPSA>150, H-acc>10, H-don>5
[Num. rings < 7](#)
[Num. carbon > 4](#)
[Num. heteroatoms > 1](#)
[Num. rotatable bonds <](#)
[15](#)
[H-bond acc. < 10](#)
[H-bond don. < 5](#)

Bioavailability Score

Abbott Bioavailability Score: Probability of F > 10% in rat implemented from [Martin YC. 2005 J. Med. Chem.](#)

0.17

Medicinal Chemistry

PAINS

Pan Assay Interference Structures: implemented from [Baell JB. & Holloway GA. 2010 J. Med. Chem.](#)

0 alert

Brenk

Structural Alert: implemented from [Brenk R. et al. 2008 ChemMedChem](#)

0 alert

Leadlikeness

Leadlikeness: implemented from [Teague SJ. 1999 Angew. Chem. Int. Ed.](#)
250 < MW < 350
XLOGP < 3.5
Num. rotatable bonds < 7

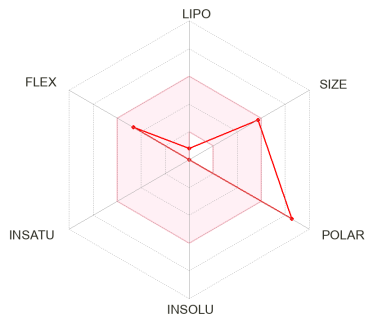
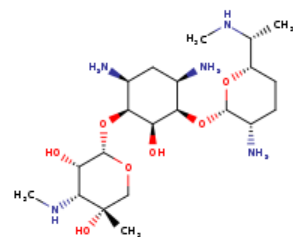
No; 1 violation: MW>350

Synthetic accessibility

Synthetic accessibility score: from 1 (very easy) to 10 (very difficult) based on 1024 fragmental contributions (FP2) modulated by size and complexity penalties, trained on 12'782'590 molecules and tested on 40 external molecules ($r^2 = 0.94$)

6.51

Molecule 19



SMILES CN[C@@H]([C@@H]1CC[C@@H]([C@@H](O1)O[C@@H]1[C@@H](N)C[C@@H]([C@@H]1O)O[C@@H]1OC[C@]([C@@H]([C@@H]1O)NC)(C)O)N)N

Physicochemical Properties

Formula C21H43N5O7



Water Solubility

Log S (ESOL)

ESOL: Topological method implemented from [Delaney JS. 2004 J. Chem. Inf. Model.](#)

0.24

Solubility Class

8.37e+02 mg/ml ; 1.75e+00 mol/l

Solubility class: [Log S scale](#)
Insoluble < -10 < Poorly
< -6 < Moderately < -4
< Soluble < -2 Very < 0
< Highly

Highly soluble

Molecular weight	477.60 g/mol	Log <i>S</i> (Ali)	
Num. heavy atoms	33	Ali: Topological method implemented from Ali J. et al. 2012 J. Chem. Inf. Model.	0.51
Num. arom. heavy atoms	0		
Fraction Csp3	1.00		
Num. rotatable bonds	7	Solubility	1.54e+03 mg/ml ; 3.23e+00 mol/l
Num. H-bond acceptors	12	Class	
Num. H-bond donors	8	Solubility class: Log <i>S</i> scale	
Molar Refractivity	118.31	Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Highly soluble
TPSA			
Topological Polar Surface Area:			
Calculated from Ertl P. et al. 2000 J. Med. Chem.	199.73 Å²		
		Log <i>S</i> (SILICOS-IT)	
	Lipophilicity	SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	0.52
Log <i>P</i> _{o/w} (iLOGP)			
iLOGP: in-house physics-based method implemented from Daina A et al. 2014 J. Chem. Inf. Model.	3.03		
Log <i>P</i> _{o/w} (XLOGP3)		Solubility	1.56e+03 mg/ml ; 3.27e+00 mol/l
XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry.	-4.10	Class	
		Solubility class: Log <i>S</i> scale	
		Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly	Soluble
Log <i>P</i> _{o/w} (WLOGP)			Pharmacokinetics
WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.	-3.33	GI absorption	
		Gastrointestinal absorption: according to the white of the BOILED-Egg	Low
Log <i>P</i> _{o/w} (MLOGP)		BBB permeant	
MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.	-2.92	BBB permeation: according to the yolk of the BOILED-Egg	No
Log <i>P</i> _{o/w} (SILICOS-IT)		P-gp substrate	
SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, http://www.silicos-it.com	-3.56	P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94	Yes
Consensus Log <i>P</i> _{o/w}	-2.18	CYP1A2 inhibitor	No
Consensus Log <i>P</i>_{o/w}: Average of all five		Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90	

[predictions](#)

[External: ACC=0.84 /
AUC=0.91](#)

CYP2C19 inhibitor ⓘ

**Cytochrome P450
2C19 inhibitor: SVM**
[model built on 9272
molecules \(training set\)](#)
 and tested on 3000 molecules (test set) No
[10-fold CV: ACC=0.80 /
AUC=0.86](#)
[External: ACC=0.80 /
AUC=0.87](#)

CYP2C9 inhibitor ⓘ

**Cytochrome P450 2C9
inhibitor: SVM model**
[built on 5940 molecules
\(training set\)](#)
 and tested on 2075 molecules (test set) No
[10-fold CV: ACC=0.78 /
AUC=0.85](#)
[External: ACC=0.71 /
AUC=0.81](#)

CYP2D6 inhibitor ⓘ

**Cytochrome P450 2D6
inhibitor: SVM model**
[built on 3664 molecules
\(training set\)](#)
 and tested on 1068 molecules (test set) No
[10-fold CV: ACC=0.79 /
AUC=0.85](#)
[External: ACC=0.81 /
AUC=0.87](#)

CYP3A4 inhibitor ⓘ

**Cytochrome P450 3A4
inhibitor: SVM model**
[built on 7518 molecules
\(training set\)](#)
 and tested on 2579 molecules (test set) No
[10-fold CV: ACC=0.77 /
AUC=0.85](#)
[External: ACC=0.78 /
AUC=0.86](#)

Log K_p (skin
permeation) ⓘ

Skin permeation:
[QSPR model](#) -12.12 cm/s
[implemented from
Potts RO and Guy RH.
1992 Pharm. Res.](#)

Druglikeness

Lipinski ⓘ

Lipinski (Pfizer) filter:
[implemented from
Lipinski CA. et al. 2001
Adv. Drug Deliv. Rev.](#)
[MW < 500](#)
[MLOGP < 4.15](#)
[N or O < 10](#)
[NH or OH < 5](#)
 No; 2 violations: NorO>10,
NHorOH>5

Ghose ?

Ghose filter:[implemented from](#)[Ghose AK. et al. 1999 J.](#)[Comb. Chem.](#)[160 < MW < 480](#)[-0.4 < WLOGP < 5.6](#)[40 < MR < 130](#)[20 < atoms < 70](#)No; 2 violations: WLOGP<-0.4,
#atoms>70

Veber ?

Veber (GSK) filter:[implemented from](#)[Veber DF. et al. 2002 J.](#)[Med. Chem.](#)[Rotatable bonds < 10](#)[TPSA < 140](#)

No; 1 violation: TPSA>140

Egan ?

Egan (Pharmacia)**filter:** [implemented](#)[from](#)[Egan WJ. et al. 2000 J.](#)[Med. Chem.](#)[WLOGP < 5.88](#)[TPSA < 131.6](#)

No; 1 violation: TPSA>131.6

Muegge ?

Muegge (Bayer) filter:[implemented from](#)[Muegge I. et al. 2001 J.](#)[Med. Chem.](#)[200 < MW < 600](#)[-2 < XLOGP < 5](#)[TPSA < 150](#)[Num. rings < 7](#)[Num. carbon > 4](#)[Num. heteroatoms > 1](#)[Num. rotatable bonds <](#)[15](#)[H-bond acc. < 10](#)[H-bond don. < 5](#)No; 4 violations: XLOGP3<-2,
TPSA>150, H-acc>10, H-don>5

Bioavailability Score ?

Abbott Bioavailability**Score:** [Probability of F](#)[> 10% in rat](#)[implemented from](#)[Martin YC. 2005 J.](#)[Med. Chem.](#)

0.17

Medicinal Chemistry

PAINS ?

Pan Assay Interference**Structures:**[implemented from](#)[Baell JB. & Holloway.](#)[GA. 2010 J. Med.](#)[Chem.](#)

0 alert

Brenk ?

Structural Alert:[implemented from](#)[Brenk R. et al. 2008](#)[ChemMedChem](#)

0 alert

Leadlikeness ?

No; 1 violation: MW>350

Leadlikeness:[implemented from](#)

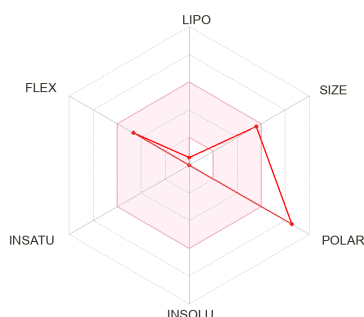
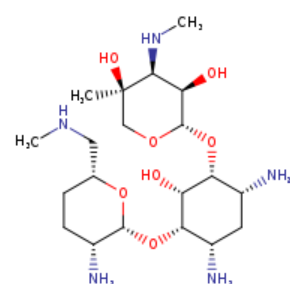
[Teague SJ. 1999 Angew. Chem. Int. Ed. 250 < MW < 350 XLOGP < 3.5 Num. rotatable bonds < 7](#)

Synthetic accessibility [?]

Synthetic accessibility

score: from 1 (very easy) to 10 (very difficult) based on 1024 fragmental contributions (FP2) modulated by size and complexity penalties, trained on 12'782'590 molecules and tested on 40 external molecules ($r^2 = 0.94$)

Molecule 20



SMILES CNC[C@H]1CC[C@H]([C@H](O1)O[C@H]1[C@@H](N)C[C@H]([C@H]([C@H]1O)O[C@H]1OC[C@@]([C@H]([C@H]1O)NC)(C)O)N

Physicochemical Properties

Formula C₂₀H₄₁N₅O₇
 Molecular weight 463.57 g/mol
 Num. heavy atoms 32
 Num. arom. heavy atoms 0
 Fraction Csp³ 1.00
 Num. rotatable bonds 7
 Num. H-bond acceptors 12
 Num. H-bond donors 8
 Molar Refractivity 113.50
 TPSA [?]

Topological Polar Surface Area:

Calculated from 199.73 Å²
[Ertl P. et al. 2000 J. Med. Chem.](#)

Lipophilicity
 Log $P_{o/w}$ (iLOGP) [?]

iLOGP: in-house physics-based method implemented from 2.33
[Daina A et al. 2014 J. Chem. Inf. Model.](#)

Log S (ESOL) [?]

ESOL: Topological method implemented from
[Delaney JS. 2004 J. Chem. Inf. Model.](#)

Solubility Class [?]

Solubility class: Log S scale
 Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log S (Ali) [?]

Ali: Topological method implemented from
[Ali J. et al. 2012 J. Chem. Inf. Model.](#)

Solubility Class [?]

Solubility class: Log S scale
 Insoluble < -10 < Poorly < -6 < Moderately < -4 < Soluble < -2 Very < 0 < Highly

Log S (SILICOS-IT) [?]

SILICOS-IT: Fragmental method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com>

Solubility

Water Solubility

0.60

1.85e+03 mg/ml ; 4.00e+00 mol/l

0.96

4.18e+03 mg/ml ; 9.02e+00 mol/l

Highly soluble

0.53

1.58e+03 mg/ml ; 3.40e+00 mol/l

Log $P_{o/w}$ (XLOGP3) [?]

XLOGP3: Atomistic and knowledge-based method calculated by XLOGP program, version 3.2.2, courtesy of CCBG, Shanghai Institute of Organic Chemistry

-4.53

Log $P_{o/w}$ (WLOGP) [?]

WLOGP: Atomistic method implemented from Wildman SA and Crippen GM. 1999 J. Chem. Inf. Model.

-3.72

Log $P_{o/w}$ (MLOGP) [?]

MLOGP: Topological method implemented from Moriguchi I. et al. 1992 Chem. Pharm. Bull. Moriguchi I. et al. 1994 Chem. Pharm. Bull. Lipinski PA. et al. 2001 Adv. Drug. Deliv. Rev.

-3.14

Log $P_{o/w}$ (SILICOS-IT) [?]

SILICOS-IT: Hybrid fragmental/topological method calculated by FILTER-IT program, version 1.0.2, courtesy of SILICOS-IT, <http://www.silicos-it.com>

-3.79

Consensus Log $P_{o/w}$ [?]

Consensus Log $P_{o/w}$: Average of all five predictions

-2.57

Class [?]

Solubility class: Log S scale
 Insoluble < -10 < Poorly Soluble
 < -6 < Moderately < -4
 < Soluble < -2 Very < 0
 < Highly

Pharmacokinetics

GI absorption [?]

Gastrointestinal absorption: according to the white of the BOILED-Egg Low

BBB permeant [?]

BBB permeation: according to the yolk of the BOILED-Egg No

P-gp substrate [?]

P-glycoprotein substrate: SVM model built on 1033 molecules (training set) and tested on 415 molecules (test set). 10-fold CV: ACC=0.72 / AUC=0.77 External: ACC=0.88 / AUC=0.94 Yes

CYP1A2 inhibitor [?]

Cytochrome P450 1A2 inhibitor: SVM model built on 9145 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.83 / AUC=0.90 External: ACC=0.84 / AUC=0.91 No

CYP2C19 inhibitor [?]

Cytochrome P450 2C19 inhibitor: SVM model built on 9272 molecules (training set) and tested on 3000 molecules (test set). 10-fold CV: ACC=0.80 / AUC=0.86 External: ACC=0.80 / AUC=0.87 No

CYP2C9 inhibitor [?]

Cytochrome P450 2C9 inhibitor: SVM model built on 5940 molecules (training set) and tested on 2075 molecules (test set). 10-fold CV: ACC=0.78 / AUC=0.85 External: ACC=0.71 / AUC=0.81 No

CYP2D6 inhibitor ?

Cytochrome P450 2D6**inhibitor:** SVM model

built on 3664 molecules

(training set)

and tested on 1068 molecules (test set) No

10-fold CV: ACC=0.79 /

AUC=0.85

External: ACC=0.81 /

AUC=0.87

CYP3A4 inhibitor ?

Cytochrome P450 3A4**inhibitor:** SVM model

built on 7518 molecules

(training set)

and tested on 2579 molecules (test set) No

10-fold CV: ACC=0.77 /

AUC=0.85

External: ACC=0.78 /

AUC=0.86

Log K_p (skin permeation) ?**Skin permeation:**

QSPR model

implemented from

Potts RO and Guy RH.

1992 Pharm. Res.

-12.34 cm/s

Druglikeness

Lipinski ?

Lipinski (Pfizer) filter:

implemented from

Lipinski CA. et al. 2001

Adv. Drug Deliv. Rev.

MW < 500

MLOGP < 4.15

N or O < 10

NH or OH < 5

No; 2 violations: NorO>10,
NH or OH>5

Ghose ?

Ghose filter:

implemented from

Ghose AK. et al. 1999 J.

Comb. Chem.

160 < MW < 480

-0.4 < WLOGP < 5.6

40 < MR < 130

20 < atoms < 70

No; 2 violations: WLOGP<-0.4,
#atoms>70

Veber ?

Veber (GSK) filter:

implemented from

Veber DF. et al. 2002 J.

Med. Chem.

Rotatable bonds < 10

TPSA < 140

No; 1 violation: TPSA>140

Egan ?

Egan (Pharmacia)**filter:** implemented

from



Egan WJ. et al. 2000 J.

Med. Chem.

WLOGP < 5.88

TPSA < 131.6

No; 1 violation: TPSA>131.6

Muegge **Muegge (Bayer) filter:**[implemented from](#)[Muegge I. et al. 2001 J.](#)[Med. Chem.](#)[200 < MW < 600](#)[-2 < XLOGP < 5](#)[TPSA < 150](#)[Num. rings < 7](#)[Num. carbon > 4](#)[Num. heteroatoms > 1](#)[Num. rotatable bonds <](#)[15](#)[H-bond acc. < 10](#)[H-bond don. < 5](#)No; 4 violations: XLOGP3<-2,
TPSA>150, H-acc>10, H-don>5Bioavailability Score **Abbott Bioavailability****Score: Probability of F**[> 10% in rat](#)

0.17

[implemented from](#)[Martin YC. 2005 J.](#)[Med. Chem.](#)

Medicinal Chemistry

PAINS **Pan Assay Interference****Structures:**[implemented from](#)


0 alert

[Baell JB. & Holloway](#)[GA. 2010 J. Med.](#)[Chem.](#)Brenk **Structural Alert:**[implemented from](#)

0 alert

[Brenk R. et al. 2008](#)[ChemMedChem](#)Leadlikeness **Leadlikeness:**[implemented from](#)[Teague SJ. 1999 Angew.](#)[Chem. Int. Ed.](#)

No; 1 violation: MW>350

[250 < MW < 350](#)[XLOGP < 3.5](#)[Num. rotatable bonds <](#)[7](#)Synthetic accessibility **Synthetic accessibility****score: from 1 (very****easy) to 10 (very****difficult)****based on 1024****fragmental contributions** 6.33**(FP2) modulated by size****and complexity penalties,****trained on 12'782'590****molecules and tested on****40 external molecules****(r² = 0.94)**